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THE DOUBLE-DYED VILLAINS
By Poul Anderson

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Editor

JOHN W. CAMPBELL, JR.
W2ZGU

Assistant Editor

C. TARRANT

COVER BY ORBAN

Illustrations by Cartier, Hicks and Orban

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NARROW LIMITS

Man's a lot tougher organism than we members of the species normally believe. We humans can see the sleek, deadly fighting power in the slim-waisted, smooth-flowing muscles of a 120-pound leopard, the supple grace of a panther. But the reactions of any wild deer are adequate evidence that the deer sees just as much sleek deadly fighting power in the slim-waisted, smooth-flowing muscles, the supple grace of a 120-pound girl. The fact that normally leopard, panther, or lion will, in the wild, carefully avoid the girl indicates that the great cats, too, appreciate human beings as powerful, vicious and deadly animals.

But man exceeds all other animals in his ability to live anywhere, on anything—even without the full benefits of a highly developed technology. The Eskimo can survive the far North—and while a musk ox can also, the musk ox, unlike the Eskimo, couldn't survive in a Central American rain forest. Being an omnivore, Man gets along nicely where either horses or wolves would starve—and being smart, can survive where both horses and wolves would starve.

Moreover, man can do fairly well in high altitudes, and low, on rich diets and poor. The variety of things a man can eat and thrive on

is far more remarkable than we ordinarily have occasion to think about. We've got a fine, free-wheeling sort of digestion that works on almost anything on Earth.

On Earth. Be it noted, that that phrase is important, and worthy of a bit of consideration. It's been taken for granted in science-fiction that the same general omnivorous system will work elsewhere. I strongly suspect that the chances are several thousand to one against it. Let's take a few items into consideration, and see what we get.

First, we're sadly handicapped in our discussion, because terrestrial-type metabolisms are, of course, the only ones we have to deal with, and the only ones we have to argue from. However, some interesting very minor deviations that occur, even here on Earth, are worth considering.

For one thing, be it remembered that for some two billions of years plant-forms have been trying to work out methods of making their tissues as toxic as possible, so that animal-forms won't destroy them. The animal forms have, during the same long period, been evolving metabolic systems capable of taking aboard any hellish brew the plants could cook up, and getting nourishment out of it. The *Sequoia Gigantea*—the

giant redwoods—have, for instance, evolved a practically bug-proof bark. It contains so much free tannic acid that any bug trying to bore through gets turned into a low, but very dead, grade of leather. The fox-glove plant didn't evolve digitalis for the purpose of curing heart trouble; it made a darned good try at elaborating something deadly enough to discourage any animal that ate it. There's an African plant that's one step up on the animal world so far; it is toxic—i.e., animals haven't yet evolved a metabolic system for handling the toxin it's discovered. It's fluoroacetic acid, and is *really* poisonous.

Then there are areas in the West where *all* plant life is deadly, and even animals that have eaten the plants and haven't yet died of it are themselves toxic. That isn't the plant's fault; the plants are sick, too, but not as sick as the plant-eaters. The ground is very poor in sulfur, and rich in selenium; all terrestrial metabolisms are based in part on sulfur, and when it's lacking, the plants try to make-do with its chemical brother, selenium. For plants, selenium's a fairly good substitute. For animals, it's deadly. A lot of unexpected elements are essential to animal metabolism. Cobalt, for instance. Nobody guessed that, till the dying sheep and cattle in one section of Australia led to some high-power research. No disease, no poison, nothing seemed to account for it—till a little cobalt salt was sprayed into the soil. There's

an obscure vitamin that needs cobalt in the molecule.

Our blood depends on an iron compound, hemoglobin; lobsters depend on a copper compound. There's a marine worm that uses a vanadium compound as its oxygen-carrier.

Now let's assume we have a new, lush, Earth-like planet of an alien's sun. The oxygen-rich atmosphere, and plentiful water, the pleasant temperature and gentle climate all seem ideal. Our hero lands, and tries one of the tempting golden fruit he sees a local monkeylike beastie eating.

And it takes nearly ten minutes for the resultant violent convulsions to tear his muscles apart, and let him die. Two billion years of evolution on *this* planet have turned up a whole string of things that were, once, virulent poisons, but have now been so adjusted to by local animals they act as vitamins. John Q. Hero isn't a local animal—and the whole string hit him simultaneously. If he'd lived long enough, he'd have died of selenium poisoning, because *these* plants and animals use selenium instead of sulfur. But he wouldn't have, even without the organic-molecule poisons; on this planet plants—and, of course, animals—use fluoro-carbons generously in their metabolic processes. That, as a matter of fact, is why his twisted corpse is covered with those angry red blotches. Violent contact dermatitis—super poison ivy.

The Editor.

THE DOUBLE-DYED VILLAINS

BY POUL ANDERSON

E. E. Smith suggested one way of maintaining peace in the Galaxy. But there might be another, equally effective method—

Illustrated by Orban

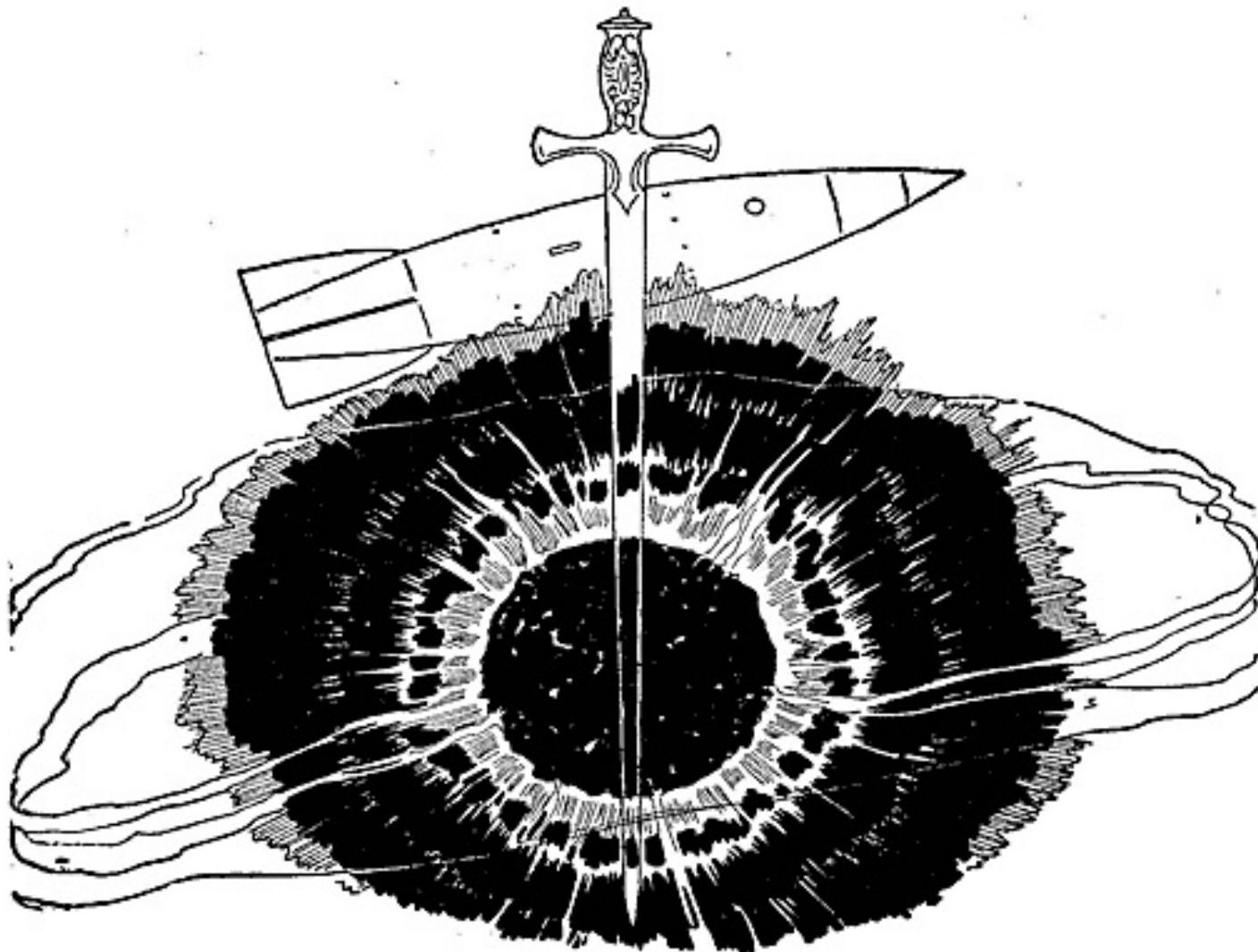
The Premier of Luan was speaking, and over the planet his face glared into telescreens and his voice rang its anger. Before the Administration Building milled a crowd that screamed itself hoarse before the enormously magnified image on the wall, screamed and cheered and surged like a living wave against the tight-held lines of the Palanthian Guard. There was mob violence in the air, a dog would have bristled at the stink of adrenalin and sensed the tension which crackled under the waves of explosive sound. The tautness seemed somehow to be transmitted over the screens, and watchers on the other side of the world raved at the image.

The Premier was young and dynamic and utterly sure of himself. There was steel in his tones, and his hard handsome face was vibrant

with a deep inward strength. He was, thought Wing Alak, quite a superior type.

In spite of being in the capital of the planet, Alak preferred sitting alone in his hotel room and watching the telescreen to joining the mob that yelled its hosannahs in the streets. He sat back with a drink in one hand and a cigarette in the other, physically relaxed as the speech shouted at him:

"...not only a matter of material gain, but of sacred Luanian honor. Lhing was ours, ours by right of our own blood and sweat and treasure, and the incredible betrayal of the League in giving it to Marhal as a political bribe shall not be permitted to succeed. We will fight for our rights and honor—if need be, we will fight the Patrol itself—fight and win!"



The cheers rose fifty stories to rattle the windows of Alak's room. Overhead rushed a squadron of navy speedsters, their gravitic drives noiseless but the thunder of cloven air rolling in their wake, and each of them carried bombs which could wipe out a city. Alak's thoughts turned to a more potent menace, the monster cruisers and battleships orbiting about Luan—yes, the situation was getting out of hand. He wondered, suddenly and grimly, if it might not have gone too far to be remedied.

"... we will not fight alone. The whole Galaxy waits only one bold leader to rise and throw off the yoke of the League. For four hundred years we have groaned under the most corrupt and cynical tyranny ever to rise in all man's tortured history. The League government remains in power only by such an unbelievable network of intrigue, bribery, threat, terror, betrayal, and appeal to all the worst elements of society that the like has never before been imagined. This is not mere oratory, people of Luan, it is sober

truth which we have slowly and painfully learned over generations. Your government has carefully compiled a list of corrupt and terroristic acts of the Patrol which include every violation of every moral law existing on every planet in the universe, and each of these accusations has been verified in every detail. The Marhalian thievery is a minor matter in that list—but Luan has had enough!"

Wing Alak puffed on his cigarette in nervous breaths. It was, he reflected bleakly, not exaggerated more than political oratory required, and the anger of Luan's Tranis Voal had its counterpart on more planets than he cared to think about.

The speech paused for cheers, and the door chime sounded in Alak's room. He turned in his seat, scowling, to face the viewplate. It showed him a hard, unfamiliar face, and his hand stole toward his tunic pocket. Then he thought: *No, you fool! Force is the most useless possible course—here!*

He rose, pressing the admittance button, and he felt his spine crawl as four men entered. They were obviously secret agents—only what did police want with a harmless commercial traveler from Maxlan IV?

"Wing Alak of Sol III," declared one of the men, "you are under arrest for conspiracy against the state."

"There . . . must be some mistake." Alak licked his lips with just the right amount of nervousness, but his stomach was turning over with the magnitude of this catastrophe. "I

am Gol Duhonitar of Maxlan IV—here, my papers."

The detective took them and put them in a pocket. "Forged identity papers are important evidence," he said tonelessly.

"I tell you, they're genuine, you can see the Patrol stamp and the League secretary for Maxlan has his signature—"

"Sure. Doesn't prove a thing. Search him, Gammal."

Voal's voice roared from the tele-screen: "As of today, Luan has officially seceded from the Galactic League, and war has been declared on Marhal. And let the Patrol's criminals dare try to stop us!"

Thokan looked across the table at his visitor, and then back at the notes heaped before him. "Just what does this mean?" he asked slowly.

The newcomer, a Sirian like himself, shrugged. "Let's not waste time," he said. "You want to win the coming system-wide election. Here are fifty thousand League credits, good anywhere in the civilized Galaxy, as a retainer. There are a million more waiting if you lose."

Thokan half rose, then settled back. His tendrils hung limply. "Lose?" he whispered.

"Yes. We don't want you as Director of this system. But we have nothing against you personally, and would rather pay you to conduct a losing campaign than spend even more money corrupting the electorate and otherwise fighting you. If you really try, you can win an hon-

est election. But we are determined that Ruhoc shall continue as Director, and, to put it melodramatically, we will stop at nothing to insure your defeat."

Strickenly, Thokan looked into the visitor's bleak eyes: "But you said you were from the Patrol!"

"I am."

"The Patrol—" Thokan's voice rose. "But Cosmos! The Patrol is the law-enforcement agency of the League!"

"That's right. And, friend, you don't know what a really dirty campaign is like till you've seen the Patrol in action. However, we don't want to ruin your reputation and your private business and the honesty of a lot of officials connected with elections. We would much prefer simply to pay you to stop campaigning so effectively."

"But— Oh, no— But *why*?"

"You are an honest being, too honest and too set in your views—including a belief in the League constitution's clause that the Patrol should stay out of local politics—for us. Ruhoc is a scoundrel, yes, but he is open to suggestions if they are, shall I say, subsidized. Also, under him the present corruption and hopeless inefficiency of the Syrian military forces will continue."

"I know—it's one of the major points in my campaign— Cosmos, you race-traitor, do you want the Centaurians simply to come in and take us over?" Thokan snarled into the Patrolman's impassive face. "Have they bribed the Patrol? Do

they really run the League? You incredible villain, I—"

"You have your choice." The voice was pitiless. "Think it over. My orders are simply to spend what is necessary to win Ruhoc the election. How I spend it is a matter of indifference to me."

As the policeman approached him, Alak drew a deep breath and let one hand, hanging by his side, squeeze the bulb in that tunic pocket. The situation was suddenly desperate, and his act was of ultimate emergency.

The sphere of brain-stunning supersonic vibrations emitted by the bulb was so heterodyned that most of Alak's body, including his head, was not affected. But otherwise it had a range of some meters, and the detective dropped as if poleaxed. They'd be out for some minutes, but there was no time to lose, not an instant of the fleeing seconds. Alak grabbed his cloak, reversing it to show a dark blue color quite unlike the gray he had been seen wearing. He put its cowl over his red hair, shading his thin sharp features, and went out the door. The change should help some when his description was broadcast. It had better help, he thought, grimly. He was the only Patrolman on a planet that had just proclaimed its intentions of killing Patrolmen on sight.

Hurry, hurry!

He went down the nearest gravity shaft and out the lobby into the street. Voal's speech had just ended,

and the crowds were howling themselves hoarse. Alak mingled with them. Luan having been colonized largely by Baltravians, who in turn were descendants of Terrestrials, he was physically inconspicuous, but his Solarian accent was not healthy at the moment. Sol was notoriously the instigator and leader of the Galactic League.

The street telescreens were showing a parade of the Palanthian Guard, rank upon brilliantly uniformed rank of the system's crack troops, and the brassy rhythm of their bands pulsed in the veins and shrieked in the head. *Beat, beat, beat,* yelling bugles and rolling drums and the heart-stopping slam of a thousand boots landing simultaneously on the pavement. Swing and crash and tramp, aircraft snarling overhead with their sides afire in the sun, banners flying and trumpets roaring and the long wild charge of heroes to vengeance and glory. All Luan went crazy and shouted for blood.

Alak reflected tautly that the danger to Marhal was no less threatening other systems. The Luanian battle fleet could get to Sol, say, in three weeks, and if Voal suspected just how strong the Patrol really was—or wasn't—

Alak had seen the dead planets swinging on their lonely way. Their seas mourned on ashen beaches, and the ash blew inland on whining winds, in over the dusty plains. Their suns were a dim angry copper-red, smoldering in skies of scudding dust

and ash. Only the wind and the dust stirred, only the empty heavens and the barren seas had voice. At night there might still be an evil blue glow of radioactivity, roiling in the ash storms or glimmering out of the fused craters. Here and there the wind might briefly uncover crumbling skeletons of once sentient creatures, with only dust now stirring in their hollow skulls, with the storms piping through their ribs. A few snags of broken buildings still stood, and now and then there were acid rains sluicing out of the birdless skies. But no life stirred anywhere. War had passed by, and returned to the remotely shining stars.

He made his way through the jammed avenue into a quieter side street. Any moment, now, he could expect the hunt to start. He went with careful casualness over to a parked private car, a fast little ground-air job. He had a Patrol key, which would open any ordinary magnetolock, and with it he let himself into the vehicle and got started. Car stealing was a minor offense compared to what he was wanted for.

As he drove, he scowled in thought. That Voal's police had known him for what he was indicated that the leader's interests and spy system reached well beyond the local stars. He must have agents on Maxlan IV, which lay seventy light-years from Luan's sun. If he had known the name of the Patrol's agent, it would indicate that he knew a lot more about the Patrol itself, and

this supposition was supported by Voal's mention of fully verified cases of League perfidy. Though it was no secret that the Patrol used corrupt methods, the details were carefully suppressed wherever possible.

What was more to the immediate point, the police must have followed all Alak's movements. So now his underworld contacts must be arrested, leaving Alak stranded and alone on Luan. And a League agent who had associated himself with some of the worst crooks on the planet could expect no particular mercy.

Headquarters underestimated the danger, thought Alak. They took this to be just another obscure squabble between frontier systems, and now Luan turns out to be a highly organized, magnificently armed power spoiling for a fight. I suppose slip-ups are bound to occur in trying to co-ordinate a million stars, and this is one of the mistakes—and I'm in the middle of it.

He drove aimlessly, trying to collect his thoughts. Six weeks of careful work in the Luanian underworld were shot. His bribes and promises had been getting a program of sabotage under way which should have thrown plenty of sand in the gears of the war machine. He was on the point of contacting ambitious officers who were ready to overthrow the elected government and establish their own dictatorship—one amenable to the Patrol as long as it had free access to the public treasury. Only—Cosmos, he'd been finding it too

easy! The police had been stringing him along, giving him enough rope to hang himself several times over, and now—

Wing Alak licked his lips. A lot of Patrolmen got killed on the job, and it looked as if he would be another name on the list, and he personally much preferred being a live coward to a dead hero. He did not have a single lethal weapon, and he was alone on a planet out to get him. It didn't look good.

The hall was old, a long dim structure of gray stone, where only the leaping ruddy flames broke the chill dusk and where the hollow echoes were like voices of the dead centuries which had stirred bloodily here. Many a council had been held in the great chamber, the results being announced with screaming war-horns and the clash of arms and armor, but perhaps none so dark as the secret meeting tonight.

The twelve earls of Mordh were seated at the head of the huge ancient table. Red firelight seemed to splash them with blood, throwing their grim bony faces into eerie visibility against the sliding misshapen shadows. Outside the windows, the mighty autumn wind flung sleet and rain at the castle walls and roared about its towers.

Dorlok, who had called the meeting, spoke first. His deep voice was low, and the storm snarled over and around its rumble: "To me, at least, the situation has become intolerable. When so-called honor clashes with

basic instincts—and just how much honor does our dead king have left?—there is only one choice if we wish to remain sane. The king must go."

Yorm sprang out of his seat. The light gleamed bloodily on his slitted yellow eyes. Three of his fists were clenched, the fourth half drew his dagger from its sheath. "Treason!" he gasped.

"As you like." Dorlok's scarred face twisted in a snarl. "Yet I would say that we have a higher duty than our oath to the king. As earls of Mordh, which now rules the entire planet and thus our entire species, we are pledged to preserve the integrity of our race and traditions. This the king, corrupted by the she-devil Franna, has lost. He is no longer a warrior, he is a drinker and idler in his palace—the swords of Mordh rust, the people cry for battle, and *he* sits under the complete dominion of his mistress. This won't be the first time a king has been deposed—and we will be driving her off the throne rather than him."

More than half of the earls nodded their heads in dark agreement. Valtan murmured: "I wonder if she is of this planet at all? Could she not be some devilish robot invented by the Patrol's unholy agents? Her very nature is alien to all we know."

"No, no, my agents have checked very carefully on her background," said Dorlok. "She is the daughter of a Mordhan spaceman who sold her on Sol III after he had run up a great gambling debt—sold her to a man of the very Patrol which seeks

to destroy slavery, or says it does! Franna was educated in the Solar System, apparently with the ultimate object of becoming the king's mistress. I have reason to believe plastic surgery was used to make her the most beautiful of our race, and certainly her education in the arts of love—At any rate, she did come back here, enslaved the king, and now for ten years has run the country—the planet—the system! And—undoubtedly on behalf of the cursed Patrol!"

"It was an evil day that the Galactic explorers landed here," said Valtan glumly.

"To date, yes," answered Yorm. "Of course, it was more or less accidental. If they had known we are a carnivorous people to whom combat is a psychological necessity, they would probably have left us in our feudal state. As it was, the introduction of Galactic technology soon enabled Mordh to subjugate the rest of the planet." His yellow eyes flamed. "And now . . . now we could go out and fight on a more glorious scale than the old heroes dreamed . . . go out conquering among the stars!"

"Except that Franna holds the king slothful while we eat our hearts in tameness and kill ourselves in silly little private duels for lack of better occupation," said Valtan. "But we are sworn by our honor to obey the king. What to do? What to do?"

"Kill her," snarled another.

"Little use—the king would know who had done that, and have us all slain—and soon the Patrol would find

some other agent of control," said Dorlok. "No, the king must go, too."

Yorm shook his head. "I won't do it. No one in my family ever broke his word and I won't be the first."

"It is a hard choice—" mused Valtan.

In the end, seven of the great earls of Mordh were prepared to assassinate the king. The others held back, but Dorlok had, before calling the meeting, sworn them to secrecy about it. They would not help in the killing, but they would not hinder it and be glad enough to see it done.

Dorlok swept his cloak about him. "I'll let you know my arrangements tomorrow," he said.

He went to a certain remote room in the castle and let himself in with a special key. *She* was waiting, and his heart turned over at her loveliness.

"Well?" she asked.

His voice was thick as he gave her the names of the rebellious earls. She nodded gravely. "I'll see that they are arrested tonight," she said. "They'll have their choice—exile to the second planet or suicide."

Dorlok sat down, burying his head in two brawny hands, the other two hanging limp in his lap. "Now I'm forever damned," he groaned. "I really, deep inside, believe in what I told them when I was provoking them. Those 'weak links' were actually the hope of Mordh. And I've sold them—for you." He lifted desperate eyes. "And I'm even betray-

ing my lord the king, with you," he said hopelessly. "I love you—and I curse the day I saw you."

Franna stroked his mane. "Poor Dorlok," she murmured softly. "Poor, helpless, honest warrior."

Alak abandoned his car in an alley near the spaceport and set out on foot through the dark tangle of narrow streets and passageways which was the Old City. The decayed district clustered on the west side of the port and its warehouses, and had become the hangout of most of the city's criminal elements. It was not wise to go alone after dark through its dreary huddle, and twilight was beginning to creep over the capital. But Alak had no choice—and he had become used to such thieves' quarters.

Presently he located Yamen's tavern and slipped cautiously past the photoelectric doors. The place was crowded as usual with the sweepings of space, including a good many nonhumans from remote planets, and he was grateful for the dim light and the fog of smoke. There was a live show performing on a tiny stage, but even its nudity was no recommendation and Alak did not regret having to sit with his back to it in order to watch the door. He sat at a small table in a dark corner and slipped a coin in the vendor for beer. When it arrived from the chute it was warm and thin, but it was at least alcoholic. He sipped it and sat gloomily waiting for something to happen.

That didn't take long. A Rassalan slithered into the chair opposite him. The reptile's beadily glittering eyes searched under the man's cowl. "Hello," he said. "You might buy me a drink. Wouldn't snub an old friend, would you?"

"Hardly, when the old friend would let out a squawk as to my identity if I did," said Alak wryly. He set the vendor for the acrid and ultimately poisonous vurzin to which he knew the Rassalan was addicted, and put in the coin. "How are things, Slinh?" he asked.

"So-so." The little dragonlike creature shrugged his leathery wings. "But the sivva-peddling racket is getting unsafe. Voal's narcotics squad is cracking down. I can't complain—made my share on this planet—but I'm about to leave Luan." His black passionless eyes studied Alak's foxy face. "I suppose you are, too."

"Why so?" asked the Solarian cautiously.

"Look, Sarb Duman—I might as well stick to the alias you've been giving around here, though the police have been broadcasting a certain other name for the past half hour or more—let's be sensible. When an unknown with apparently limitless resources starts organizing the crooks of a planet for something big whose nature he won't reveal exactly, a being who's seen something of the Galaxy begins to have suspicions. When the police suddenly pick up all this stranger's contacts and start televising 'Wanted' notices for him with a different name and oc-

cupation appended—well, any high-grade moron can guess the story." Slinh sipped his drink, adding smugly, "I consider myself a step above moron. Seems I have just now heard rumors of arrests in the army, too. Seems there has been a revolutionary tendency— Could the mysterious stranger have any connection?"

"Could be," said Alak. He didn't inquire into the nature of the so quickly spreading rumors, or how they had got started. Someday the Patrol must investigate the evidence hinting at some race in the Galaxy which had not chosen to reveal its telepathic abilities but to use them instead for private advantage. At the moment there was more urgent business.

"I might have a little trouble leaving this planet," said Alak. "You might, too."

"I can always find a hiding place and go into hibernation for a few years till they forget about me," said Slinh. "But a human at large might have difficulties even staying alive. I doubt if any Luanian crooks would help a"—he lowered his hissing voice—"Patrolman now that there's a war on. In such times, the mob hysteria officially known as patriotism infects all classes of society."

"True. But illogical. Patrolmen are more tolerant toward lawbreakers than local police."

Slinh shook his scaly head in some bewilderment. "I never could figure out the Patrol," he said. "Even its

members of my own race I can't understand. Officially it exists to co-ordinate the systems of the Galactic League and to enforce the laws of the central authority. But after a while I quit paying attention to the stories of fabulous raids and arrests by Patrolmen and began watching for myself and speaking to eyewitnesses. And y'know, I have not been able to verify one case of the Patrol acting directly against a crook. The best they ever do is give the local police some technical advice, and that's rare. I'm beginning to suspect that the stories of the huge Patrol battle fleet are deliberate lies and the stereographs of it fakes—that though the Patrol makes big claims, it's never yet really arrested a criminal. In fact"—Slinh's claws tightened about his glass—"it seems one of the most corrupt organizations in the Galaxy. Voal's speech today was—true! I know of more cases where it's made alliance with crooks, or supported crooked governments, or engaged in crooked political deals, that I could easily count. Like in this case here—first the Patrol, on the feeblest 'right of discovery' excuse, awards Lhing to the Marhalian System—Lhing, that was a Luanian development from the first—and then it seeks to overthrow the democratically elected Luanian government and set up some kind of revolutionary junta that's sure to empty the public coffers before running for a distant planet. I don't blame Luan for seceding from the League!"

"You could turn me in," said

Alak. "There must be a reward."

"Not I," said Slinh. He grinned evilly. "The police don't approve of sivva or those who sell it. Also, what's Luan to me? They could blow up the planet for all I care—once I'm off it. And finally—it's barely possible we could make a deal."

Alak ordered another beer and vurzin. "Pray continue," he said. "You interest me strangely."

Despite his purpose, despite the knowledge he had and the implacable hostility which seethed within him, Sharr felt a stirring of awe as he entered the cathedral. The long nave loomed before him, a dusky immensity lit with the wonderful chromatic sunlight that streamed through the stained-glass windows; the vaulted ceiling was lost in a twilight of height through which fluttered white birds like living benedictions; the heavy languor of incense was in the cool dark air, and music breathed invisible beauty about him from—somewhere. Here, he thought, was peace and security, rest for the weary and hope for the grieving—

Aye, the peace and security of death, the resting from duty, and a false cold-bloodedly manufactured hope which destroyed souls. The magnificent shell of the cathedral covered a cosmic rottenness that—

The archbishop stood waiting for him near the great altar, resplendent in the dazzling robes of the new church. He was of this planet, Crios, but tall and impressive, with the cold



wisdom of the Galaxy behind his eyes—the upper clergy of the new god were all Crians educated on League planets. Sharr was acutely conscious of his own shabby dress and his own ignorance of the cynical science that made miracles to order. No wonder all Crios was turning from the old faith to this lying devil who called himself a new god.

"Greeting, my son," said the archbishop sonorously. "I was told by my angel you were coming hither and—"

"I am not your son," said Sharr flatly, "and I happen to know that your 'angel' is a creature from the stars who has to live in a tank but

has the unholy power to read men's thoughts—"

"That is blasphemy," said the archbishop mildly, "but since you have been misled all your life, even to the extent of becoming a high priest of the false god, you will be forgiven this time."

"Oh, I know your artificial thunderbolts—you must have some, all your other miracles are artificial—could smite me where I stand," said Sharr wearily. "No matter. My knowledge will not die with me."

The archbishop's eyes narrowed. Sharr hurried on: "When the strangers first came from beyond the stars, they brought a great hope to

Crios. They cured us of many ancient ills, they gave us machines which produced more abundantly than slaves ever could . . . oh, yes, all the nations of Crios were glad to unify and join their Galactic League as a whole planet. But now I see all this was but the mask of the Evil Ones."

"In what way?" asked the other. "Before, there was only one faith on Crios. Now all gods can compete equally. If the stronger—that is, the truer—gods drive the weaker from the hearts of the people, what harm? Rather it is good. If your god is true, let him produce miracles such as ours."

"Let us not mince words," said Sharr. "There is no one here but us. All Crios rejoiced at the possession of spaceships, for now we could bring the true faith to other worlds, saving countless souls from the Evil Ones. But no sooner had we begun organizing a great crusade than *you* appeared—and your sly words and your false miracles and your machine-made magnificence turn more and more Crian hearts to the god in which you yourselves do not believe."

"How do you know we don't?"

"Few Crians have been to space, and most of those who went have returned as traitors like yourself," said Sharr. "I went to see what power this Galactic lord of yours has elsewhere. I had my own ship and I used my own eyes. I saw that no other world had ever heard of him. I saw machines doing the same sort

of things which you do here, seemingly by the power of your god, to impress the ignorant—building your churches overnight, scattering gold from nowhere, turning one metal into another; I saw creatures of horrible aspect which read minds— Oh, I began to see what your god really was. When I came back, I did a little investigation, I had my spies here and there—I know you for the cold-blooded liars you are."

"Why should we lie? What is the point in preaching a false religion?"

"Power, glory—I can think of many reasons, but my personal belief is that you are agents of the Evil Ones, sent to destroy the great Crian crusade before it got started. Had all of this planet been pure in faith, the All-Father would have aided us and we would have swept the Galaxy before us into his fold—now we must first get rid of the false Galactic lord and then slowly, by prayer and repentance, win back our worthiness."

The archbishop smiled, a curiously chilling smile. "And how will you go about it?" he asked softly.

"I have taken care that all priests of the true faith know what I do," said Sharr. "It won't help you to kill me. We will tell the truth to the people. We have prepared machines which will duplicate a number of your miracles." Sharr lifted a clenched fist and his voice shook with triumph: "I came, really, to warn you—if you're wise, you will leave this planet at once!"

The expected dismay did not appear. The archbishop said calmly

and implacably: "You might be better off doing that. Surely you don't think we didn't foresee this?"

With a sense of dawning horror, Sharr stood in the singing gloom while the white birds circled far overhead. He heard the steady, relentless voice continue:

"I doubt if your machines will work. You never heard of an inhibitor field, but we have our projectors ready to generate one over the whole planet if need be. But it will not stop certain other devices we have had in preparation. If you blaspheme against the Galactic lord, major miracles will be in order. The lord himself might appear, ten kilometers tall with lightning blazing around him. Can your god do that?"

"Then"—Sharr spoke out of a dry, constricted throat—"you admit it is true—?"

"If you like," said the archbishop cheerfully. "But try to get anyone to believe that."

Slinh had a room—more accurately, a den—in one of the old abandoned sewers under the city. The little stony niche was dank and slimy and vile-smelling, but it was at least fairly safe from the police who were rounding up all aliens. Wing Alak sat hunched on the floor and cursed the day he was born.

"This hideout may be saving my life," he grumbled, "but I wonder if life is worth saving on such terms."

The little reptile coiled before him leered complacently. "It's all I can

offer the great Patrolman," he gibed. His eyes glistened in the dim glow of the radiant heater that was his sole article of furniture. "If you don't like it—"

"Never mind, never mind." Alak tried to get down another mouthful of the fishy mess the Rassalan called food, but decided it involved too great a risk of losing what he already had eaten. "Now about this deal you offered to make—we have to act fast. Already we're too late to prevent the war, but it'll take the Luanian battle fleet a few days to get started for Marhal, or the Marhaliens a few days to get to us. In that time we have to stop the war. Once battle is joined, it'll be pretty hopeless before several million have been killed."

"Never mind the pious platitudes," said Slinh coldly. "A being who makes deals with sivva peddlers can't afford to moralize. The point is that I'm running a terrific risk in helping you and will expect a commensurate reward."

"Such as—?"

"How about a million League credits? That's a good round number."

"Done." Alak reached for his checkbook. "Only I'll give you my personal check. Then if I'm killed and you escape"—he grinned in the sullen red light—"it'll do you no good, because I haven't near that much in my account. But if we both survive, the Patrol will transfer a million to me and you'll get 'em."

"How do I know you won't welsh?"

"You don't. But if you think back, you may recall that the Patrol has that much honor. Not that we have any notions about the sacredness of oaths—I've committed perjury often enough when the occasion called for it—but we don't want to antagonize allies such as yourself. You, for instance, get around. You have contacts. We may have other jobs for you in the future."

"I may be a sivva runner," said Slinh contemptuously, "but I haven't yet sunk to being a Patrolman." He took the check and laid it carefully in the purse worn about his neck. "Very well. Now I've given you a hideout, but you can't stay here long. So I'll help you along further in case you can find a way for us both to get off this planet."

"If I complete my job, we both will," replied Alak. "If I don't, it'll be too bad—for me at any rate." He looked into the dripping gloom of the tunnel. The light was like blood on his thin pale face.

Slinh shivered. "You're crazy as well as a crook," he said. "Two hunted, weaponless beings against an armed system—Starfire, even stereofilms don't indulge in that kind of trash any more." He huddled closer to the heater. "Why doesn't your glorious Patrol just bring its great battle fleet over here and tell the Luanians there'll be peace or else? What kind of policeman is it that makes deals with criminals and skunks in old sewers?"

Alak ignored the complaint. Presently he stirred, holding cold hands

over the red glow. "Voal is officially only premier of Luan and its colonies on other planets," he said. "But he has influence enough to swing events as he wishes."

"Unfortunately, he believes in what he says. You can't bribe him."

"No, maybe not. Unless the price was sufficiently high—Look, he's married. He has two little children, and I don't think those pictures of him playing with them are all posed."

"If you're thinking what I'm thinking—" began Slinh. "Anyway, the secret service guards—"

Alak took the vibrosphere out of his pocket. "I fooled them with this once," he said. "It's a secret Patrol weapon and it may fool them again. It has to!" Briefly, he explained its operation. Then he went on, his voice rising with excitement:

"Voal has a private estate in the country, about fifty kilometers from here. His family should be there—and you can carry a three-year-old child—"

They sneaked out of the tunnel after dark, emerging in a narrow alley of the Old City. Crouching back into the shadows, they strained their senses—no, no vigilance beyond routine patrols and the tension that lay like a shroud over the whole planet, the expectation of death from the skies. The whole capital huddled under its force dome, waiting for the hammer blows of hyperatomic bombs and gravity snatchers, the silent murder of radiodust and biotoxin and all the synthetic hell which could lay

waste a world in hours. Whether or not the enemy bombardments could penetrate that shield was an open question—it was the business of the navy to see that the matter was never decided, by going to Marhal and blowing the system open before the Marhaliens took off for Luan.

Alak and Slinh went along the darkened walks. Not many beings were abroad, though the taverns shooks with an unnatural hysterical merriment. It was no trick to find a parked ground-air car and appropriate it with the help of Alak's key. The difficulty would lie in escaping from the city.

The Patrolman sent the car whispering into the sky, toward the dimly glowing force-field. In moments, the call screen was buzzing and blinking an angry red. Alak switched over to the police band, keeping his face cowled and shadowed. An indignant helmeted head glared out of the screen at him.

"Where do you think you're going?" demanded the policeman.

"Officer, I've got to get out of the city," said Alak. "My wife and children—"

"The screen isn't lowered for any civilian in wartime. One second without protection and— Now get back on the ground where you belong."

"Be reasonable, officer. If the Marhaliens were within ten light-years you'd be alerted. I... I wasn't expecting war. I left my family up at North Pole Resort—that's no place for them to be in wartime. They'll

recall my wife anyway, she's an electronician—"

"How many times must I—"

"Of course, I could take it up with my old friend Jeron Kovals," said Alak, naming the city police chief, "but I didn't think he'd want to be bothered—"

"Well, there's a lot of military and government traffic tonight. Wait till the next official car comes along, then you can go out with it."

"Thanks," Alak snapped off the screen and let his body relax, muscle by muscle. It was as much as he'd dared hope for. But if his theft was discovered while he waited—

It wasn't. The stolen car slipped past the lowered force-dome together with a long sleek black flier bearing several stars. Alak took a direct north course until the city was behind the horizon, then opened the car up and swung in a screaming arc for the Premier's estate.

Nighted countryside slipped beneath him. The numbers representing position co-ordinates changed on the car's dashboard. He let the auto-pilot take over, and studied the landscape below.

"Mostly agricultural," he said. "But... wait, there's a pretty big region of forested hills. We'll hide there."

"If we escape to hide," said Slinh gloomily.

When they were within a kilometer of Voal's home, Alak halted the car and hung motionless on its gravity beams. "They'd detect a metal object coming any closer," he

said. "I'll wait here for you, Slinh."

Wordlessly, the reptile opened the door. His leathery wings flapped and the night swallowed him.

The servants were wakened by a shout and the sound of falling bodies. A blaster roared in the dark. Someone screamed, and there was heard a beating of wings out the nursery window.

When order of a sort was restored, it was found that—something—had come into the room, rendering several guards unconscious on the way; one, who had had a brief glimpse at which he had fired, swore it was a devil complete with tail and bat-wings. Be that as it may, Alia, youngest daughter of the Premier of Luan, was missing, and a note addressed to her father lay on the floor.

He read it with his cheeks whitening:

Bring ten thousand League credits in unmarked bills tomorrow night at 0100 hours to that island in the Mortha River lying one hundred and three kilometers due south-southwest of your country house. Do not tell police or make any attempt to use tracer beams or otherwise trail us, or you will not see your child again.

The Zordoch of the Branna Kai was dead, and over the whole planet Cromman and such other planets of the system as had been colonized, there was mourning; for the hereditary chief of the most powerful of the clans had been well loved.

Duwan stood at the window and looked out over the great estate of

his fathers. Torches bobbed through the dusk, a long ceremonial procession approached the castle with the slowness of ancient ritual. The weird skirl of pipes and the rolling thunder of drums rose in the evening, breaking in a surf of sound against the high stone walls, surf that sent its broken spindrift up to the ears of Duwan. He savored the sound, hungrily.

The Zordoch of the Branna Kai was dead; and the chiefs of the clans were coming with their immemorial ceremonies to give the crown to his eldest son.

A slave entered, genuflecting before the tall arrogant figure, purple-robed and turbaned, that stood before the window. "Your pardon, lord," he said fearfully, "but a stranger desires admittance."

"Eh?" Duwan scowled. The castle was closed to all but the slowly approaching chiefs. The old rituals were not to be disturbed, nor did Duwan wish distraction in this greatest of hours. He snarled his gathering anger: "I'll have the warders' heads for this."

"Sire," mumbled the slave, "he did not come in by the gates. He landed on the roof in an airship. He is not of Cromman, but from some strange world—"

"Hm-m-m?" Duwan pricked up his ears, and an ominous tingle ran along his spine. He could not imagine a Galactic having much interest in as newly discovered and backward a system as this. Later, of course, after a progressive had held

the Zordochy for a few years—but now—“Send him in.”

The stranger came so quickly that Duwan suspected he had been on the way while the slave went ahead to get permission. The Crommanite recognized him as terrestrial, though he did not have the look of a Solarian—probably some colonist. What was more to the point, he wore the blue uniform of the League Patrol.

The human bowed formally. “Your pardon,” he said, “but I am on an urgent mission.” He glanced out the window at the approaching torches. “In fact, I am almost too late.”

“That is true,” replied Duwan coldly. “I must ask you to leave before the chiefs reach the castle’s gates.”

“My business can be accomplished in less time. I am, as you see, a representative of the Patrol—here are my credentials, if you wish to see them.”

Duwan barely glanced at the papers. “I am familiar with the like,” he said. “After all, Cromman has been in the League for almost a century now, though we have had little outside contact.” He felt, somehow, irritated at the compulsion, that he must explain the fact: “When we were introduced to spaceships and the like, we naturally wished to develop our own planet and its sisters first before venturing into other worlds. Also, most of the Zordochs were conservatives. But a newer generation of leaders is arising—I myself, as you see, am about

to become head of the most influential clan—and we will see some changes now.”

“That is what I came about,” said the Patrolman. “It may seem strange, but I will make it short: I bear a most urgent request from Galactic headquarters that you refuse the crown when it is offered you tonight and direct that it be given to your younger brother Kian.”

For a moment the sheer barefaced effrontery of it held Duwan paralyzed. Then the black rage that made him grab for his sword was throttled by a grim control, and when he spoke his voice was unnaturally level: “You must be mad.”

“Perfectly sane, I assure you. But hurry, please, the procession will be here soon.”

“But what imaginable reason—Why, Kian is more hopelessly conservative than even my father—And the League constitution specifically forbids interference in the internal affairs of member planets—” Duwan shook his head, slowly, slowly. “I can’t comprehend it.”

“The Patrol recognizes no laws save those of its own making—otherwise there is only immediate necessity,” said the human cynically. “I will tell you why we wish this later, if you desire, but there is no time now. You must agree at once.”

“Why . . . you are just crazy—” The rage came again, bitter in Duwan’s throat: “If you try to impose your will forcibly on Cromman, you’ll find that our boast of being a warrior race is not idle.”

"There is no question of force. It is not necessary." The Patrolman reached into his portfolio. "You traveled quite a bit through the Galaxy some years ago. And the moral code of Cromman is stern and inflexible. Those two facts are sufficient."

With a horrible feeling of having stepped over the edge of the world, Duwan watched him extract a bundle of stereofilms, psychographs, and other material from his case. "When the chiefs arrive with the crown," said the Patrolman smugly, "I will explain that, while the League does not wish to meddle, it feels it to be a duty to warn its member planets against making mistakes. And the coronation of a Zordoch who had been guilty of, shall we say, moral turpitude in the fleshpots of the Galaxy, would be a definite mistake."

"But—" With a feeling of physical illness, Duwan looked at the pictures. "But . . . by the Spirit, I was young then—"

"So you were. But will that matter to Cromman?"

"I . . . I'll deny—"

"Stereofilms could be faked, yes, but not psychographic recordings, and there are plenty of scientists on Cromman who know that. Also we could produce a Crommanite or two who had been with you—"

"But— Oh, no!— Why, one of those Crommanites was a Patrolman who . . . who *took* me to that place—"

"Certainly. In fact, just between us—and I shall deny it on oath if you

repeat it in public—the Patrol maintains that house and others like it, and makes a point of persuading as many influential and potentially influential beings as possible to have a fling there. The records we get are often useful later on."

Duwan reached for his sword. The Patrolman said evenly: "If I fail to report back, this evidence will be made public. I think you will be wiser to refuse the Zordochy for reasons of . . . well, ill health. Then this information can safely gather dust in the Patrol's secret files."

For a long, long moment Duwan stared at the sword. The tears blurring his eyes seemed like a film of rust across the bright steel. Then he clashed it back into its sheath.

"I have no choice," he said. "But when the League breaks its own laws, and employs the filthiest blackmailers to do the job, then justice is dead in the Galaxy."

Three days later, Alak's agreed code call went over the Luanian telescreens. Slinh received it and lifted the stolen car into the air. "Now be quiet," he told the dirty, tear-faced child with him. "We're going back to Daddy." He added to himself, "Of course, it's possible that Daddy had Alak drugged or tortured to give the signal. That's what I'd have tried. But if so, it's only what the Patrolman deserves for leaving me in charge of this brat."

For fear of its radiations revealing his hidden car to searchers—metal detectors were dangerous enough—

Slinh had only turned the televistor on for a few seconds at the agreed hours. Now, as he listened to the newscasts, a dawning amazement held him motionless. "Marhal has offered compromise— Premier Voal in secret conference— Secession from League being reconsidered—"

Holy Galaxy! Had Alak really pulled it off? If a crook like that Patrolman, hunted and alone, could overturn a planet—

Slinh set his vehicle down on the lawn of the Premier's city residence. The force dome was down and only a few military craft were in sight. Peace—

Tranis Voal stood before the house with his arm about his wife's shoulders. There were no other officials in sight, with the possible exception of Alak. The Patrolman stood to one side, his hair like coppery fire in the sun, the look of a fox who has just raided a chicken coop on his sharp face; but there was somehow a loneliness over him. Though he was the conqueror he was still one man against a world.

Slinh led the child outside. Voal uttered a queer little choking cry and fell on his knees before her. When he looked up, tears gleamed in his eyes and ran down his haggard cheeks. "She's all right," he choked. "She's all right—"

"Of course she's all right," said Alak impatiently. "Now that your government has gone too far toward peace to back down, I don't mind telling you that no matter what your attitude would have been, she

wouldn't have been harmed. Patrolmen may have no scruples, but we aren't fiends." He added slowly, somewhat bitterly, "Only a completely honest man, a fanatic or a fool, can be really fiendish."

Slinh tugged at Alak's sleeve. "Now will you tell me just what happened?" he hissed.

"What I hoped for," said Alak. "After you left me on the island and took the kid into hiding, I just waited. That night Voal showed up with the money."

"Hm-m-m—so you also got a little personal profit out of it," said the Rassalan slyly.

"I didn't want his money, I didn't take it," said Alak wearily. "The ransom demand was simply a device to make him think a gang of ordinary kidnapers had taken the girl. If he'd known it was the hated and untrustworthy Patrolman who had her, he'd probably have been out of his head with fear and loathing, have brought all the cops on the planet down on me, and . . . well, this way I got him alone and I had a club over his head. I told him the Patrol couldn't weigh the life of one child against several million, perhaps billion, and that we'd kill the kid if he didn't listen to reason. He did. I came here with him, secretly, and used him as my puppet. With his emergency powers, he was able to stop the scheduled assault on Marhal and swing the government toward conciliation. A truce has been declared, and a League mediator is on the way."

Voal came over. The wrath that had ravaged his face still smoldered sullenly in his eyes. "Now that I have her back," he said, "how do you know I'll continue to follow your dictates?"

"I've come to know you in the last few days," answered Alak coolly. "One thing I've found out is that, unlike me, you're a perfectly honest man, and you want to do what you think is right. That makes it possible for me to take an oath of secrecy from you and reveal something which will—I hope—change your attitude on this whole matter."

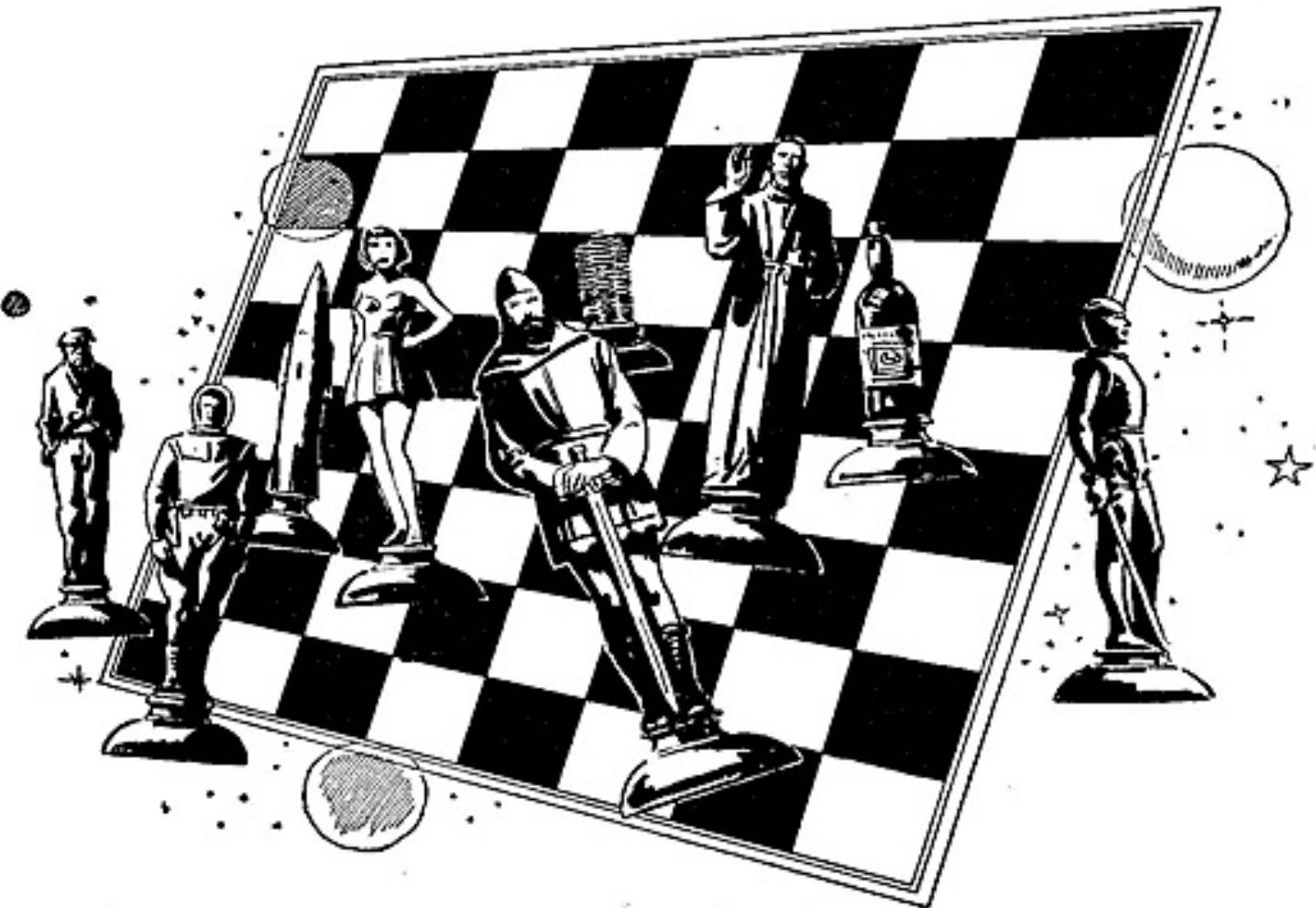
"That will have to be something

extraordinary," said Voal icily.

"It is. If we could find a private place—?"

Slinh looked wistfully after the two men as they entered the house. He'd give a lot to eavesdrop on that conference. He had a shrewd suspicion that the greatest secret in the Galaxy was about to be revealed—which could have been useful to him.

They were in Voal's study before Alak said: "I want to get over that barrier of hostility to me you still have. I think you're objective enough to have seen in the last few days that the Patrol has no desire to oppress Luan or discriminate against



it. Our job is to keep the peace, no more and no less, but that involves a paradox which we have only been able to resolve by methods unknown to policemen of any other kind. You can't forgive my murderousness toward your child—but I repeat that there never was any. We would not have harmed her under any circumstances. But we had to make you think otherwise till my job was done."

"I can stand it myself," said Voal grimly. "But what my wife went through—"

"That was tough, wasn't it?" Suddenly the bitterness was alive and corrosive on Alak's face. Contempt twisted his thin lips. "Yes, that was really rugged, all three days of it. Have you ever thought how many *millions* of mothers this holy war of yours would have left without any prospect of getting their children back?"

Voal looked away from his bleak eyes and, for lack of better occupation, began to fumble with bottles and glasses. Alak accepted his drink but went on speaking:

"The basic secret of the League Patrol—and I want your solemn oath you will never breathe a word of it to anyone—" he waited till Voal gave agreement, "is this: The Patrol may under no circumstances take life. We may not kill."

He paused to let it sink in, then added: "We have a few impressive-looking battleships to show the Galaxy and overawe planets when

necessary, but they have never fought and never will. The rest of the mighty fleet is—nonexistent! Faked pictures and cooked news stories! Patrolmen may have occasion to carry lethal weapons, but if they ever use them it means mnemonic erasure and discharge from the service. We encourage fiction about the blazing guns of the Patrol—we write quite a bit ourselves and call it news releases—but it has absolutely no basis in fact."

He smiled. "So, though we might kidnap your daughter, we would certainly never kill her," he finished.

Voal sat down. His knees seemed suddenly to have failed him. But he looked up, it was with an expression that Alak found immensely cheering. He spoke slowly: "I can see why a reputation as formidable fighters would be a great asset to you—but why stop there? Why can't you stand up and fight honestly? Why have you, instead, built up a record of such incredible villainy that the worst criminals of the Galaxy could not equal it?"

Alak relaxed into a chair and sipped his cocktail. "It's a long story," he said. "It goes right back to the beginning of interstellar travel."

He searched for words a moment, then began: "After about three centuries of intercourse between the stars, it became plain that an uncoordinated Galactic civilization would inevitably destroy itself. Consider the problems in their most elementary form. Today there are over a million civilized stars, with a popu-

lation running up over ten to the fifteenth, and exploration adds new ones almost daily. Even if that population were completely uniform, the sheer complexity of administrative detail is inconceivable—why, if all government services from legislators to postmen added up to only one percent of the total, and no government has ever been that efficient, that would be some ten to the thirteenth individual beings in government! Robocomputers help some, but not much. You run a system with a population of about two and a half billion, and you know yourself what a job that is.

"And then the population is not uniform, but fantastically diverse. We are mammals, warm-blooded, oxygen breathing—but there are intelligent reptiles, birds, fish, cephalopods, and creatures Earth never heard of, among the oxygen breathers alone—there are halogen breathers covering as wide a range, there are eaters of raw energy, there are creatures from worlds almost next to a sun and creatures from worlds where oxygen falls as snow. Reconciling all their needs and wants—

"The minds and the histories of the races differ so much that no intelligence could ever imagine them all. Could you think the way the communal race-mind of Sturvel's Planet does? Do you have the cold emotions of a Vergan arthropod or the passionate temper of a Goldran? And individuals within the races usually differ as much as, say, hu-

mans do, if not more. And histories are utterly unlike. We try to bring the benefits of civilization to all races not obviously unfit—but often we can't tell till too late. Or even . . . well, take the case of us humans. Sol has been at peace for centuries. But humans colonizing out among the stars forget their traditions until barbarians like Luanians and Marhaliens go to war!"

"That hurt," said Voal very quietly. "But maybe I deserved it."

Alak looked expectantly at his empty glass. Voal refilled it and the Patrolman drank deep. Then he said:

"And technology has advanced to a point where armed conflict, such as was at first inevitable and raged between the stars, is death for one side and ruin for another unless the victor manages completely to wipe out his foe in the first attack. In those three unorganized centuries, some hundreds of planets were simply sterilized, or even destroyed. Whole intelligent races were wiped out almost overnight. Sol and a few allies managed to suppress piracy, but no conceivable group short of an overwhelming majority of all planets—and with the diversity I just mentioned such unanimity is impossible—could ever have imposed order on the Galaxy.

"Yet—such order was a necessity of survival.

"One way, the 'safest' in a short-term sense, would have been for a powerful system, say Sol, to conquer

just as many stars as it needed for an empire to defend itself against all comers, without conquering too many to administer. Such a procedure would have involved the permanent establishment of totalitarian militarism, the murder or reduction to peonage of all other races within the imperial bounds, and the ultimate decadence and disintegration which statism inevitably produces.

"But a saner way was found. The Galactic League was formed, to arbitrate and co-ordinate the activities of the different systems as far as possible. Slowly, over some four centuries, all planets were brought in as members, until today a newly discovered system automatically joins. The League carries on many projects, but its major function is the maintenance of interstellar order. And to do that job, as well as to carry out any League mandates, the Patrol exists."

With a flash of defiance, Voal challenged: "Yes, and how does the Patrol do it? With thievery, bribery, lies, blackmail, meddlesome interference— Why don't you stand up openly for the right and fight for it honestly?"

"With what?" asked Alak wearily. "Oh, I suppose we could maintain a huge battle fleet and crush any disobedient systems. But how trustful would that leave the others? How long before we had to wipe out another aggrieved world? Don't forget—when you fight on a planetary scale, you fight women and children and innocent males who had nothing whatsoever to do with the trouble.

You kill a billion civilians to get at a few leaders. How long before the injustice of it raised an alliance against us which we couldn't beat? Who would stay in a tyrannical League when he could destroy it?

"As it is, the Galaxy is at peace. Eighty or ninety percent of all planets know the League is their friend and have nothing but praise for the Patrol that protects them. When trouble arises, we quietly settle it, and the Galaxy goes on its unknowing way. Those something times ten to the fifteenth beings are free to live their lives out without fear of racial extinction."

"Peace can be bought too dearly at times. Peace without honor—"

"Honor!" Alak sprang from his chair. His red hair blazed about the suddenly angry face. He paced before Voal with a cold and bitter glare.

"Honor!" he sneered. "Another catchword. I get so sick of those unctuous phrases— Don't you realize that deliberate scoundrels do little harm, but that the evil wrought by sincere fools is incalculable?"

"Murder breeds its like. For psychological reasons, it is better to prohibit Patrolmen completely from killing than to set up legalistic limits. But if we can't use force, we have to use any other means that comes in handy. And I, for one, would rather break any number of arbitrary laws and moral rules, and wreck a handful of lives of idiots who think with a blaster, than see a planet go up in flames or . . . or see

one baby killed in a war it never even heard about!"

He calmed down. For a while he continued pacing, then he sat down and said conversationally:

"Let me give you a few examples from recent cases of Patrol methods. Needless to say, this is strictly confidential. All the Galaxy knows is that there is peace—but we had to use every form of perfidy and betrayal to maintain it."

He thought a moment, then began: "Sirius and Alpha Centauri fought a war just before the founding of the League which nearly ruined both. They've managed to reconstruct since, but there is an undying hatred between them. League or no League, they mean to be at each other's throats the first chance they get.

"Well, no matter what methods we use to hold the Centaurians in check. But on Sirius the government has become so hopelessly corrupt, the military force so graft-ridden and inefficient, that action is out of the question.

"Now a vigorous young reformer rose, honest, capable, popular, all set to win an election which would sweep the rascally incumbents out and bring good government to Sirius for the first time in three centuries. And—the Patrol bribed him to throw the election. He wouldn't take the money, but he did as we said, because otherwise, as he knew, we'd make it the dirtiest election in even Sirian history, ruin his business and repu-

tation and family life, and defeat him.

"Why? Because, of course, the first thing he'd have done if elected would have been to get the military in trim. Which would have meant the murder of several hundred million Centaurians—unless they struck first. Sure, we don't like crooked government either—but it costs a lot less in lives, suffering, natural resources, and even money than war.

"Then there was the matter of an obscure barbarian system whose people are carnivorous and have a psychological need of combat. Imagine them loose in the Galaxy! We have to hold them in check for several generations until sublimation can be achieved. Fortunately, they are under an absolute monarch. A native woman whom we had educated managed to become his mistress and completely dominate him. And when the great nobles showed signs of revolt, she seduced one of them to act as her agent provocateur and smoke out the rebellious ones.

"Immoral? Sure. But two or three centuries hence, even the natives will thank us for it. Meanwhile, the Galaxy is safe from them.

"A somewhat similar case was a race by nature so fanatically religious that they were all set to go crusading among the stars with all the weapons of modern science. We wrecked that scheme by introducing a phony religion with esoteric scientific 'miracles' and priests who were Patrolmen trained in psychotechnology—a religion that preaches peace and tolerance. A dirty trick

to play on a trusting people, but it saved their neighbors—and also themselves, since otherwise their extinction might have been necessary.

"We really hit a moral bottom in the matter of another primitive and backward system. Its people are divided into clans whose hereditary chiefs have absolute authority. When one of the crown princes took a tour through the Galaxy, our agents managed to guide him into one of the pleasure houses we maintain here and there. And we got records. Recently this being succeeded to the chiefship of the most influential clan. We were pretty sure, from study of his psychographs, that before long he would want to throw off the League 'yoke' and go off on a spree of conquest—it's a race of warriors with a contempt for all outsiders. So—the Patrol used those old records to blackmail him into refusing the job in favor of a safely conservative brother.

"Finally we come to your present case. Marhal was ready to fight for the rich prize of Lhing, and the League arbitrator, underestimating the determination of Luan, awarded the whole planet to them. That was enough to swing an election so that a pro-League government came into power there. I was sent here to check on your reactions, and soon saw a serious mistake had been made. War seemed inevitable. I tried the scoundrelly procedure of fomenting sabotage and revolution. After all, that damage would have been neg-

ligible compared to the cost of even a short war."

"The cost to Marhal," said Voal grimly.

"Maybe. But after all, I had to think of the whole Galaxy, not Luan. Sometimes someone must suffer a little lest someone else suffer a lot more. At any rate, my scheme failed. I resorted to alliance with a dope smuggler—he ruins a very few lives, while war takes them by the millions—and to kidnaping. I threatened and bluffed until you had backed up so far that mediation was possible.

"Well, that's all, then. The League commission is on its way. They'll have some other fat plum to give Luan in place of Lhing—which I suppose will make trouble elsewhere for the Patrol to settle. Your government will have to go out of power after such an about-face—you're rejoining the League, of course—but I daresay it'll soon get back in. And you have been entrusted with a secret which could split the Galaxy wide open."

"I'll keep it," said Voal. He smiled faintly. "From what I know of your methods—I'd better!" For a moment he hesitated, then: "And thanks. I was a fool. All Luan was populated by hysterical fools." He grimaced. "Only I still wonder if that isn't better than being a rogue."

"Take your choice," shrugged Wing Alak. "As long as the Galaxy keeps going I don't care. That's my job."

THE END

PROGRESS REPORT

RESTRICTED

Progress Report, Third Quarter,
1949

From: Northeastern Divisional
Laboratories
EtSH Area, Massachusetts
To: National Council on Science
and Technology
Washington, D. C.
(by courier)
File Number: 5.591-JHP

Introduction:

This is to be considered as a covering report, summarizing the work of the past three months in our several divisions. Fuller discussions with greater experimental detail will be forthcoming at the end of the year, in accordance with directive 37-A. A complete listing of the personnel connected with each division will be found in the attached 75-ca forms.

In general, the total progress of the work plans has been highly satisfactory, due principally to our active and progressive staff, who are to be commended for their successful attack on a number of problems, which are reported on below.

A. Thiotimoline Project Division.

Work on the determination of the structure, the synthesis, and further applications of thiotimoline has been carried on rapidly under the stimulus of a rapidly expanding staff. Scientific interest in this material has remained high ever since the preliminary announcements of its unique endochronic properties by Dr. Asimov; we are fortunate in having his services as Acting Thiotimoline Coordinator.

Effort has been directed both at increasing the amounts of the natural material to be obtained from the rose—*Rosacea karlsbadensis rufo*, Linn.—at improving purification methods, and at carrying out the laboratory synthesis of the compound. Dr. Algird has shown that the carbon skeleton of the thiotimoline molecule is undoubtedly the same as that of yohimbine, since physiological studies have shown that both molecules possess many of the same desirable properties. Systematic degradation studies with these materials show that to a large extent, the degree of degradation possible is directly proportional to the amount of experience of the

chemist, and the purity and yield-point of the material desired.

The nutritional experiments with selenium compounds applied to selected cuttings of the *Rosacea* have made it possible to carry out the bio-synthesis of selenotimoline, the selenium homolog of thiotimoline. Not only does this material possess the endochromic properties of thiotimoline but shows as well a selective reactivity to light that is not too surprising considering the known sensitivity of selenium itself. Selenotimoline darkens on exposure to light *before* the photons strike it, possibly by some amplification of the preceding probability wave function. The Polaroid Corporation has shown a great deal of interest in this application, and at present is working on a modification of the Land sixty-second camera which will give the photographer a positive print of a scene before he snaps the shutter. The potential value of this invention in saving film that might have been taken of undesired subjects, is, of course, obvious. Part of this work, however, is at present under military secrecy regulations because of the interest of the Air Force in applying these phenomena to directors and predictors for antiaircraft fire.

We would like to digress from the purely technical to report upon and discuss certain repercussions from abroad from our earlier thiotimoline publications. Recently, editorials in *Pravda* have stated: "The bourgeois mysticism of the kept scientists of the plutocracies can best be shown

in their true antidemocratic light by their fantastic claims for thiotimoline. As Harley-Short has pointed out in his article on 'Determinism and Free Will', the observations reported for thiotimoline are in direct contradiction to the Marxian principles of dialectic materialism, since there would no longer remain an orderly sequence of cause and effect. This is merely an obvious effort to foist off upon unwary scientists the discredited idealistic 'principle' of uncertainty first enunciated by the Nazi Heisenberg and taken up by the Copenhagen-Brookhaven school. The scientists of the West, unless they refuse to adhere to thiotimoline, Morgan-Mendelism, and Heisenbergism, will have much to learn of truth in science.

"Furthermore, it is well known that thiotimoline was originally discovered by a Russian as long ago as 1808. In beautiful lines well known to every Russian school child, Dr. Zhelezno Gordinok said:

"Time, time, and so it goes—
Look in the petals of the rose."

Production of thiotimoline in the peoples' democracies will be doubled in 1950."

There is little that we need to add to the above, with the exception of the fact that as far as we can learn, Dr. Gordinok's lines are merely a translation of a part of a familiar poem by Robert Herrick (1591) which reads:

"Gather ye rose buds while ye may,
Old Time is still a-flying."

B. Division of Medical Chemistry and Health Physics

One of the most interesting results of this section's work has been an improved technique for the treatment of plutonium poisoning. It has been known for some time that the principal toxic effect was due to the extremely high specific alpha-particle activity of $Pu-14 \times 10^6$ disintegrations/second milligram. Acting upon the well-known laboratory observation that alpha particles are stopped by a few thicknesses of paper, Dr. Nelson Eugen and his co-workers carried out the experiments of injecting suspensions of cellulose fibers—Laboratory grade Filter-Aid—directly into the veins of laboratory animals which had been given normally lethal doses of plutonium salts. None of the animals died of plutonium poisoning. As soon as the disadvantages of the method have been removed, it is hoped to be applied to human patients.

B1. Nuclear Physics and Radio-Chemistry

The separation of "light hydrogen" by our Isotope Separation group is felt here to rank in importance with the separation of "heavy hydrogen" by Urey in 1932. It is, of course, too early for speculations of this type to be made, but it is hoped at our laboratories that another Nobel prize may be awarded for our work in this new field.

In many ways, the discovery of light hydrogen is the story of the triumph of persistence, inspiration,

ingenuity and brilliance over the well-known innate perversity of inanimate objects. A grant of five million dollars from the United States Navy was also very helpful.

It will be remembered that the first minute samples of heavy water were obtained by the repeated electrolysis of ordinary water; the heavy water was found to be concentrated in the last residues remaining after hundreds of liters had been fractionated in this manner. It was hoped that in the same way, we could obtain a light hydrogen from the *first* fractions of the electrolysis. This, however, did not produce the expected effects; later work on the electrolytic properties of light hydrogen have shown that little, if any, separation may actually be expected in this way, since the differences in decomposition potenials are negligibly small.

Many of the techniques which had been applied on the Manhattan Project were tried: plasma diffusion, centrifugal excitation, cavital insonance, velocital spectroscopy, and even the use of the high-speed subterfuge. None proved successful. Several workers had previously postulated that differences in molar spin ratios which would be characteristic of the two atomic species when deactivated below their ground states could be used effectively for separation if the proper scalar fields could be formed and stabilized in a nonoxidizing atmosphere. It was finally concluded, after months of preliminary calculations by our

Topological Ballistics Group, that these apparently contradictory requirements could be satisfied within a narrow range of fugacity. The first test apparatus worked even better than had been expected; normal conductivity water was circulated continuously and counter-currently over a predeactivated gelated complex. The light fractions from this run were then subjected to a vapor-phase chromatographic absorption, a procedure only previously used in the separation of the cis and trans isomers of ethylene.

The final stage of separation involved passage of the light fraction—as measured by the falling drop method—through a hot tube filled with twenty-mesh zinc, followed by passage of the hydrogen so obtained through a five-ampere, four-hundred-volt arm under a pressure of five to eight atmospheres. The gas so obtained has a density of approximately half that of ordinary hydrogen, which had previously been considered to be the lightest known and lightest possible gas.

Further research is being vigorously pursued on the nuclear, chemical, and physical properties of this material. It may be expected to influence current thought and theory in many fields.

We have been exceptionally fortunate in our study of high-energy particles in having the use of the recently-completed billion-volt octotron. This “atom-smasher”, as it has been called in the popular press, works on the principle that instead of

having only one circular orbit, as in the betatron and the synchrotron, two circular orbits are produced in the Siamese-twin assembly of accelerating fields. When these two circular fields intersect tangentially, the complete orbital pattern is that of a figure “8”, from which the name “octotron” was derived. Aid in the form of a large grant of money will shortly be forthcoming from the Ballantine Corporation of America for the construction of a similar device employing three intersecting orbits.

By the usual methods of vectorial deletion, it may be seen that because of the moving frame-of-reference system of the two intersecting beams, remarkably high-energy particles may be produced. Previous workers at MIT, Berkeley, and the Clinch College for Nuclear Knowledge have produced particles with masses of about 350-600 times that of the electron. To produce these mesons, energies of the order of magnitude of 200-500 million electron-volts were required. In our equipment, near energies of one billion electron-volts, we observed particles with a rest mass of 1800 ± 200 times that of the electron. Sufficient of these super-heavy mesons have been collected by the use of decelerating fields to reveal that in large enough quantity, they possess nearly all the properties of ordinary hydrogen atoms. The significance of the discovery is not at present clear, and much further investigation will probably be necessary.

Our radiochemical section has

been rather inactive, because of experimental difficulties. However, the section investigating isotope exchange has been quite successful. We have sent a number of samples of radio oxygen and radio fluorine to other laboratories, and have obtained a number of other isotopes in return.

C. Chemistry

For a number of years, the attention of colloidal scientists, physical chemists, and others investigating the properties of solutions have been devoted to studying the effects of surface-active agents—that is, the soaps, detergents, wetting agents, et cetera, which by concentrating at the *surface* or interface of the solution, reduces its surface tension and thus change the behavior of the liquid. All of the usual phenomena of laundering, flotation recovery of minerals, bubble baths, et cetera, are the more commonly observed examples of this action. Not so well known are the materials which instead of decreasing the surface tension, tend to increase it by the so-called volume-active effect. Because of their potential military uses, we cannot give further details of the structure or synthesis of these materials; but a few examples of their mode of action might be of interest.

We were able to increase the surface tension of water to the point where it refused to flow into a pipe unless it was over five feet in diameter. This produced some rather unusual difficulties in our new laboratories, when some of the VAC

—Volume-active colloid—was accidentally spilled in the sink. It so happened that this sink was being used to discharge the flow of a bank of Soxhlet extractors. The water immediately became volume-activated, and refused to flow down the two-inch drainpipe. Before it was observed, the spheroid had grown to its maximum diameter of five point three feet. The sink collapsed under the load of some two point five tons of water, the spheroid fell through the floor into the laboratory below—fortunately empty—and bounced out through the casement window, carrying most of the frame with it.

The final removal of the spheroid was accomplished by the use of a small power crane and a rigging crew supplied by Blone and Shuster, Construction Engineers. Since then, we have learned better ways of controlling VAC and of decontaminating anything with which it has come in contact. Decontamination is a particularly vital part of the research program being carried out here, since the material is so vicious to handle. Because of the polar structure of the molecules, it has no effect on nonpolar solvents, and so may be readily handled in benzene or carbon tetrachloride solution. If a few milliliters of a two percent solution is injected into a guinea pig, the effect is almost incredible. Nothing happens for a few seconds; then as the VAC disperses into the body fluids, the surface tension of the water contained therein increases

by a number of orders of magnitude and the poor creature is transformed into a cool spherical object, looking for all the world like a furry tennis ball. So far, we have been extremely careful, and probably more than a little lucky; no accidents have happened to any of the laboratory staff. Surface active-agents of the nonionic type have so far been found to be the only effective decontaminant.

The cooling effect mentioned above is caused by the transformation of heat energy into a corresponding amount of surface energy. Possible use of this phenomenon in producing refrigeration will probably not succeed, because of the undesirable accompanying effects already mentioned.

The Synthetic Organic Group, at present under the direction of Dr. Herman Edwards, has been continuing work on compounds with a high nitrogen content. Particular attention has been directed towards the heterocyclic systems, since it is thought that the high degree of nuclear resonance and pi-orbital exchange energy would stabilize the otherwise easily-decomposed molecules. Benzene, which has the formula C_6H_6 , arranged hexagonally, has for a chemical cousin the molecule pyridine C_5H_5N , in which one of the $-CH-$ units has been replaced by $-N-$. Pyrazine, $C_4H_4N_2$; triazine, $C_3H_3N_3$; and tetrazine, $C_2H_2N_4$ are all known; and further work is under way on the replacement of still more of the

carbon by nitrogen. Pentazine, CHN_5 , and hexazine, N_6 , will be exceptionally interesting molecules, both from a theoretical and practical viewpoint. Small amounts of a purplish-red solid have been prepared which is believed to be a hexazine; but the material decomposed almost immediately into three molecules of nitrogen gas. It is somewhat more stable at low temperatures and high acidities; it is hoped to be able to keep it at a pH of from -1 to -2. Stabilizing solvents of the type of the bisozonide of dinitroacetylene are being investigated. Octazine, N_8 , which is analogous to cyclooctatetraene, will also be of interest as soon as the suitable conditions of polymerization of the nitrogen analog of acetylene are established.

The Carbohydrates Research Group has been recently reorganized, following the dismissal of Dr. Shugar, whose discovery of water-soluble cellulose had been considered such a forward step in the field. However, in view of the highly unfavorable publicity attendant upon the results of his gift of a complete set of water-soluble bathing suits to the Wellesley swimming team, it was considered advisable to part with his services. We consider ourselves fortunate in obtaining the leadership of Dr. Staerke, of the University of Zurück. This young and energetic chemist has already made a number of interesting discoveries.

Almost all known sugars are characterized by their optical rotation, or the angle through which a standard

solution of the sugar twists the plane of polarized light. A new sugar has been isolated in milligram yields from three tons of Jerusalem artichokes, using hyperbolic polarography. The sugar is birefringent, bending the plane of polarization both to the right and the left. Because of this exceptional behavior, it has already received the name of "ambidextrose".

Through a misunderstanding, an unfortunate error was made by our chemical engineering design division; a complete pilot plant was built completely upside down, due to a misinterpretation of the nature of invert sugar. This plant was originally constructed for the purpose of preparing absolute alcohol. The error has since been rectified one hundred percent.

The microchemical work involved in these researches has been greatly facilitated by the development in our laboratories of a new process for preparation of microchemical equipment. Some of the details in the manufacture of Corning's Vycor glass which have been released suggested the methods which were perfected here. In the Corning process, "a special glass of apparently normal characteristics is treated by a new and unique process in which practically all the constituents other than silica are removed by leaching in hot chemical solutions. . . . The silica residue after being washed, dried slowly, and finally fired at carefully controlled high temperatures, becomes a transparent vitreous glass

of simple chemical composition." This glass, containing ninety-six percent silica, is similar in most of its properties to fused quartz, which is of course, one hundred percent silica. The Corning process was carried one step further, however; a second leaching was made, using hydrofluoric acid; this leached out the ninety-six percent silica, leaving behind only a fragile network of the residual four percent borates, et cetera. When this was fired, after considerable shrinkage, a minute replica of the original piece of glassware was obtained. In this way, it has been possible to shrink a one-liter beaker to a microcup of only two cc. capacity. This has proven to be most successful in shrinking special apparatus, such as Podbelniak columns, separatory funnels, and Soxhet extractors, which were always considered to be impossible to make on a small scale because of the inherent difficulties of microglass-blowing.

The plastics division of the Chemical Technology Section has had under way two main courses of research. The ion-exchange resin group, which was recently taken over by the well-known woman chemist, Dr. Polly Marek, has successfully extended the usually ion-exchange systems to include the inorganic-organic exchange. Resin 5.5L will remove hydrogen ions from ordinary water, replacing them by the organic ethyl radical, C_2H_5- . The effectiveness of the reaction, its cheapness, and its convenience, probably ac-

count for its wide popularity among chemists and laymen alike. The resin has already reached commercial production, and is being offered in a number of forms. It may be bought in the form of attachments to the kitchen water faucet, or may be installed directly in fifty-gallon units at the time of construction of a house. Drinking glasses constructed of the material will shortly be offered, and buyer interest, as shown by marketing surveys, is already at a level best described as high.

Dr. Welcher has long been interested in the phenomenon of "plastic memory", that is, the way in which certain thermoplastic materials may be bent out of shape when heated. After cooling, they will hold their new shape, but upon heating, will "remember" their previous shape and return to it again. Dr. Welcher has been applying the recently elucidated Shope-Keehan theory of quantum psychology to understand the attitude of mind of the molecules and has received highly informative answers to the question of "what does a plastic have to remember?". Further work will be carried out to determine if a plastic can anticipate as well as remember and forget. Materials of this type would be highly valuable commercially for the fabrication of automobile bumpers that could duck, for instance.

D. Materials and Processes

Our theoretical division of the spectroscopic wing was particularly interested in the action of square-

pulsed polarized light on shifting absorption bands. However, for the construction of the optical set-ups necessary, including absorption cells, codiscursive refractors, and azalon gratings, it was necessary to have exceptionally pure crystals of quartz, since the impurities caught between the crystal faces exerted a disruptive effect on the advancing pulse front. The best Brazilian quartz crystals were unsatisfactory for this purpose, and we found it necessary to attempt the growth in our laboratories of hyper-pure synthetic quartz, applying some of the techniques developed by the Germans during the war, and adapted to our purposes by the modifications developed at the Jacob Wirth Foundation. It was found, however, that these crystals, while still much superior to anything previously available, were still giving us trouble, because of the materials absorbed on the crystal faces during growth.

A new and daring approach was called for, and was supplied to us by some of the developments of our Applied Topology Group, who work closely with all other divisions when some problem arises that requires their attention. Continuing beyond the discoveries of Möbius, who first created a geometrical figure with only one surface and one edge, and whose "bottle" was the first figure with only one surface and no edges, these intrepid investigators have discovered a new mathematical form with *no* edges and *no* surfaces. Naturally, even though the new form for

which a design patent is to be issued, is remarkable in its simplicity, its fabrication in usual materials has presented remarkable difficulties. Occasionally in nature, curved crystals of quartz are formed, due to peculiar sets of geochemical conditions. These conditions involved thermal differentials and osmotic tensions within a narrow range. By integrating these thermal differentials in our quartz crystallizing baths, the phasing of the slip bands was controlled to the point where it was found to be possible to make the quartz grow into the desired holotropic shape. Surface contamination was completely eliminated, since there was no surface.

We regret, however, that this has led us up a blind alley as far as our original objective is concerned, since these holotropes are completely useless for optical purposes, because refraction and reflection only take place at surfaces. We are here faced with the paradox of a material with an imaginary index of refraction.

A remarkably ingenious approach to a very old problem has given us a new material for laboratory and industrial use: transparent metal! The number of possible applications are limited only by the cost of the material; and it is hoped that when quantity production is under way, that the cost may be substantially reduced. This material is not in competition with the recently announced NESA glass, which is electrically conducting, yet still transparent; the glass still remains glass with its in-

herent limitations of brittleness and fragility. True transparent metal was known for many years in the form of gold leaf, which when produced by laborious handwork, could be made thin enough to transmit a small amount of greenish light, complementary to the golden color observed by reflected light. This suggested that if thin enough layers of platinum black could be prepared, that the light of the complementary color of white would be transmitted. Such was found to be the case, and by use of lamination techniques of the plywood industry and further worked out by the ham-sandwich division of our Department of Pharmacology, transparent layers up to 0.1 millimeters in thickness were produced. However, considerable light loss by internal reflections and scatterings cut down on the efficiency of the material, giving an undesirable bluish-gray color to the light. Use of vaporized fluoride layers, of the same type as have been found effective for reducing internal reflections in camera lenses, was found to be the final step towards success. Platinum black is usually regarded as being an expensive material; but ways have been found to reduce the amount needed, and investigations are being carried out for the development of substitute materials. Preliminary work has shown that we can expect to obtain similarly useful materials using the more easily obtainable carbon black.

The work on the fire-fighting and prevention project, which we had

undertaken at the request of the Air Force has been somewhat handicapped by several unfortunate accidents. Our main program of research has been devoted to the study of the initiation of chain reactions at the time of kindling of a fire. It has been long known that reaction will not start in a completely dry mixture of even such highly reactive systems as hydrogen and oxygen or hydrogen and fluorine. We have succeeded in preparing a stabilized aerosol, or air-suspended colloid, of phosphorus pentoxide, which is the most effective drying agent known. With small aerosol bombs similar to those now being used to dispense DDT, it has been possible to smother fires completely by drying them up at their source. This technique will not work if the conventional fire-fighting methods are used simultaneously. An accidental explosion in one of our experimental units resulted in the liberation of large volumes of the aerosol; three of our most valuable chemists were dehydrated to the point where they were totally reduced to mummies. A small monument, in the shape of a pyramid, has been raised in their memory, and all experiments of further research are now conducted under the most rigorous safety precautions.

E. Cybernetics and Robotronics

The section under this division which is particularly interested in

the classification and codification of scientific information, has obtained valuable results which promise to have far-reaching implications in a number of related fields. We have been using punched cards of the usual IBM type, into which information has been inserted by means of various codes, such as the Dysonian code for Organic compounds, the Zator-Cargyle code for abstracts of abstract concepts, the Young-Mavin code for studying semantic intercorrelations and internal contradictions of other codes, and the Turnonanoff binary switching code. We believe our most inductive new concept has been that of the introduction of the blank, or unpunched card into punched-card codification; this is believed to rank in significance with the invention of the zero in mathematical notation. This application of this new concept to work in other fields is under study at present by our Applied Philosophy and Semantic Kinetics Divisions.

Conclusions:

We feel that work has progressed in a highly satisfactory manner on all projects under our contracts. Because of the shortage of trained personnel, we do not believe it advisable to expand our research program at this time.

Respectfully submitted,
JOHN H. POMEROY,
Director of Research

THE END

SPECIAL JOBBERY

BY H. B. FYFE

The Bureau of Slick Tricks had strange problems handed them as routine assignments. The problem this time was—Was the problem an engineering, or a political difficulty?

Illustrated by Cartier

Mr. John Waterfield reached the limit of edible nail on his left small finger and moodily switched to the other hand. His watery eyes stared vacantly at the three-dimensional stellar map of colored plastic on the opposite wall of the anteroom.

The average man, privileged to examine this diagram, would have glowed with complacence. It emphasized Terra's crossroad position on the trade curves between stars of the Edge and the mighty civilizations fanning out from the Center of the galaxy. Waterfield, however, had a personal problem.

Should he expect this J. Gilbert Fuller, who had summoned him to the Bureau of Special Trading, to address him as "Mr. Waterfield"? Or "Professor Waterfield"? Or would this fat-headed bureaucrat

look down his nose and subsequently call him "Waterfield"?

"Will you please come in now, Mr. Waterfield?"

He leaped hastily to his feet, then scowled as he realized that the voice came from an address system. He stood up very straight, with his somewhat receding chin held high, but his hundred and twenty pounds hardly dented the springy floor covering.

Before going to the door, Waterfield glanced about the austere furnished room for some sort of mirror. Finding none, he smoothed back his sparse, sandy-gray hair and tugged at the cheap red neck scarf. It still failed to brighten the rumpled brown of his jacket and slacks. He opened the door, planning to sit partly sideways, so that the fellow

might overlook his having one blue and one brown eye.

The man who rose behind the shiny desk was tastefully clad in a quiet shade of crimson. Waterfield's gaze was immediately captured by the wavy golden hair. Like many before him, he added this to the artificiality of the neat mustache and lamplight tan, and so underestimated the bright blue eyes.

"Won't you sit down, Mr. Waterfield? Very glad you could find the time."

The voice was a mellow, relaxing baritone. Waterfield caught himself just before explaining that it was his off shift from the change booth at the helicopter station.

"Yeah," he said simply.

Fuller blinked, but kept a bland expression as he sat down. When his sharp glance flickered over Waterfield's features, the latter felt every freckle stand out on his sallow skin.

He determined not to mind what the other thought. He simply *had* to make a new start. A job off Terra might do it!

As Fuller made known over his desk visor his desire not to be interrupted, Waterfield tried to relax.

What if the doctors *had* been right about his "severe maladjustment involving a persecution complex"? He was all right *now*. But he supposed that he had argued over mismanagement so often that the word had been passed around. *Waterfield: clever but troublemaker.* Now he had a grip on his nerves again, but he

wondered if he could retain it. Constantly being excluded from positions of importance was sapping his newly-learned ability to get along with people. What frightened him at times was his old tendency to lose his temper and blame everything on others.

"I think you can help me in a certain matter," said Fuller, leaning back easily. "I heard your name through Dr. Coulton—"

So that was it! Now, thought Waterfield, he's wondering how I can have the I. Q. that Coulton tested and look like this.

"Yeah?" he said defiantly.

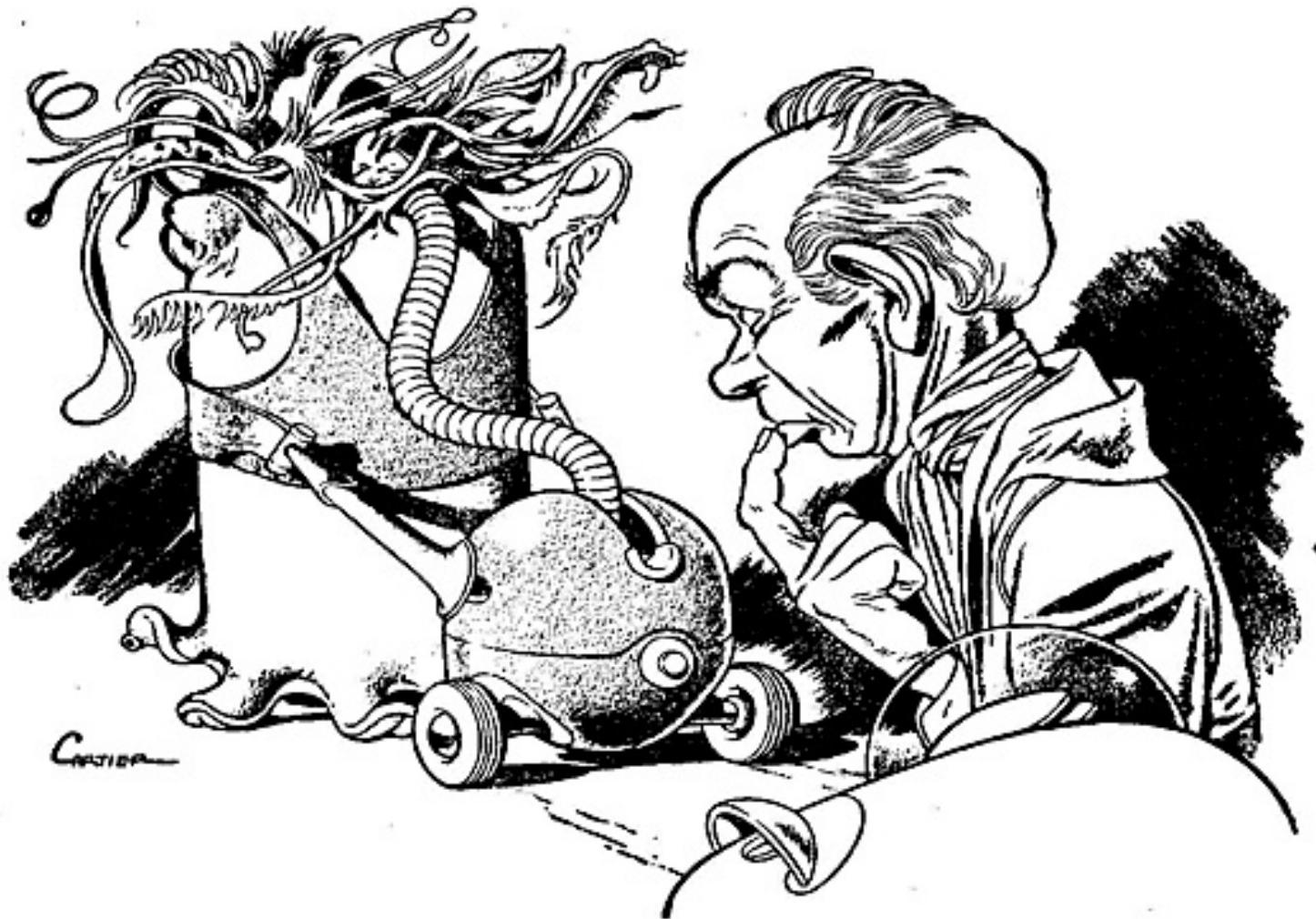
"Yeah . . . er . . . yes," Fuller continued. "Now, perhaps I should describe the function of the Bureau of Special Trading—"

"Never mind," interrupted Waterfield. "I've heard of it. 'Bureau of Slick Tricks,' they call you."

Well, perhaps the Bureau would not be too particular about past records. They were said to have all sorts of "odd" jobs, even away from Terra. All he needed was a chance to show what he could do, before he began to slip again!

The other had shrugged, gently regretful.

"An undeserved, if widespread, witticism," he deplored. "However, you can understand, then, the sort of problem I have to face. A certain outsystem spaceship has arrived on Luna from a federation toward the Center. They call themselves Chot-



zeks, and offer for sale a rather remarkable mechanism."

"Something really new?"

"Let us say the first practical application of a dream. The trouble is that we are not convinced that it is . . . ah . . . practical for Terra. They made one work on Luna, but—"

"Don't you have somebody to make a decision?" demanded his visitor.

Fuller ignored the rudeness.

"We had," he said. "Several experts, in fact. But inevitably, under their examination, the machines . . . lit up! I seem to have inherited the

problem and the only tropical island known to have been permanently de-jungled in recent decades."

"Don't buy them!" said Waterfield, rising to leave.

"Oh, really!" murmured Fuller. "The Bureau intends further investigation to be very cautious—and remunerative. We want someone who might have the deductive powers to solve the trouble without being blinkered by standard engineering habits. For all we know, it may be a bag of vacuum."

Waterfield sat down.

After the accidents, Fuller ex-

plained, the Chotzebs dealing with the Bureau had sent the machines remaining to the Luna freight base assigned their ship. They now assured the Terrans that everything had been checked and was in good order. A shipment of six units had been returned to Terra for retrial.

"What do they do?" asked Waterfield.

"It is claimed," said Fuller carefully, "that by a method of subatomic transformation which they decline to reveal, their invention will generate a form of radiation which energizes plant growth."

"Try fertilizer," suggested Waterfield.

"This process is supposedly superior in that it will nourish plant life even on bare rock. Considering the inadequacy of Terran agriculture, the mounting population, and the extremely high cost of spaceship food, we are compelled to be interested in any such dream."

"What has all this to do with me?"

"The Chotzebs agreed to let us try out their generators, as I said, but their agents claim they are suspicious. If we pry too far into the construction, they may decide to bypass Terra and deal with planetary systems nearer the Edge."

Waterfield required no elaboration. That sector of the galaxy was Terra's economic empire, and no out-system bargain peddlers were wanted.

"Now," suggested Fuller, "if we

were to present to them as our checker a perfectly average individual—"

"If you're calling me a moron," Waterfield rapped out angrily, "I can assure you I'm far from average!"

"I know, I know. You have four college degrees, despite your attitude and appearance. The last, frankly, is the most valuable to us. You were, briefly, a professor of interstellar civilization, and wrote a fine book on the subject. Also, briefly: research chemist, rocket mechanic, a city manager on Luna, and so on. Now working in a change booth on a helicopter route. Too bad you could never be patient instead of making trouble."

The little man bounced to his feet, kicking over a chair.

"You sneaking snoop!" he yelled. "So that's how you spend your time. Spying! Well, let me tell you, I have twice the brains and ability of your whole gang."

"Very probably," said Fuller agreeably. "I am offering you an opportunity to use them."

Waterfield sneered, with the enraging effectiveness of constant practice.

"*Nobody* offers me real opportunities. You'll be as jealous as the rest. Why not? I never saw a business yet that I couldn't run better than the dopes at the head of it. *That* they can't stand. Why, I even had to fake stupidity to get my present job!"

He stood, trembling with anger, in the middle of the floor, with his thin

hair ruffled into a sort of halo. Fuller had not moved, waiting for the outburst to spend itself. Waterfield was further goaded by the realization that his own misnamed eyes were brimming with uncontrollable tears of temper.

"Now, now," soothed Fuller, "let us face things. I have spoken with some of the psychiatrists you have consulted, so I know you are too intelligent to believe that."

"Who? Coulton? Khodoff?"

"Among others. The latter gentleman was quite bitter. Your little mental pranks while he thought he was collecting data caused him to take an extended vacation—"

For a second, Fuller's features suggested the bland interest of a cat in the arrival of a new canary.

"It is obvious," he continued, "that you are unable to co-operate with any human being to the least degree; but you are clever enough to defeat all attempts to repair your personality—even those you yourself request."

He leaned back in his chair, smiling pleasantly.

"The Bureau, however, is one of the most co-operative organizations Terra has ever seen. We will co-operate with you."

Waterfield reached up absently and smoothed down his sandy-gray hair.

"We will turn over the generators to you, place a new island at your disposal," pursued Fuller. "You will report only to me and your decisions will not be questioned. You

are capable of analyzing the trouble if anyone can, and if you do, you will find that the Bureau pays well. You can almost load your own tanks."

"What do you want to find out?" asked Waterfield, wavering.

"Terra has many technical colonies on completely barren planets. Spaceshipping food is prohibitively expensive. Shipping or refining materials for hydroponic installations is also no joke. We want to know if we can possibly use this invention; or, if we can not, whether it is too dangerous to stand distribution in our volume of space."

"And I can load my own tanks?" mused Waterfield.

"Well . . . we decline to commit any murders for you, but anything else that is in our power—"

Waterfield sank into his chair once again. He nodded thoughtfully. Taking this for a gesture of assent, Fuller began to brief him on the people he was about to meet; but the little man was inattentive. He knew that he could recall the conversation without listening consciously now. For the moment, he wanted to rehearse suitable dialogue for informing that toad, Parker, that he was quitting the change booth.

That evening, Waterfield followed J. Gilbert Fuller up a gracefully curving ramp into the hotel the B. S. T. maintained in the city for the outsystem visitors it had cause to entertain. Inside, Fuller excused himself to speak with the manager.

Waterfield saw the latter stare unbelievingly at him across the lobby, look again at something in Fuller's hand, and shrug resignedly. Fuller returned.

"There will be a suite for you in the oxygen wing whenever you fly back to report," he said. "You have that identocard I had you thumbprint at the office?"

Waterfield felt in his pocket and nodded.

"Keep it handy. Just show it anywhere, and they will send the bill to the B. S. T."

"Any amount?" asked Waterfield suspiciously.

"Certainly. If you need any routine work done—wire-tapping or shadowing, which I doubt—just inquire of the manager. He is the Bureau officer in charge."

The manager had not looked very important to Waterfield. Nor very bright, either. He started to make a surly comment to that effect, but remembered his own circumstances. His face might yet be his fortune with the B. S. T.

"I expect one of the Chotzeks personally," explained Fuller, leading the way to a conference room. "Until now, I have spoken only with their Terran agents."

"I thought the Bureau of Slick Tricks had complete control over all special trading," remarked Waterfield maliciously.

"Unfortunately," admitted Fuller, "they first contacted a crew of Terrans several parsecs out. A pair of those boys have welded themselves

tight, and we have to deal through them. The Bureau has not even found me a translator yet."

They found the Chotzek waiting for them, accompanied by two Terrans. Fuller introduced the latter as Ferris and Taylor. They did not introduce the Chotzek. Waterfield thought that the first might better have been called "ferret." Taylor was taller, blonder, and looked just as hard. Despite their tough confidence, however, they accorded Fuller a wary politeness.

One pirate knew another, Waterfield supposed, no matter what flag was flown. For himself, he took an immediate dislike to both strangers, and turned his attention to the out-system trader.

The latter was unimpressive. Smooth, deep-pink skin covered cylindrical body which, Waterfield thought, would fit neatly into a three-foot trash can. Multitudes of hairs, tendrils, and tentacles sprouted in seeming confusion from the top, while the body stood about six inches off the floor on half a dozen stubby feet.

The tendrils, he reasoned, must contain sensory equipment, for he could see no other features. Perhaps the coarse hairs contained similar organs, repeated with various ranges of sensitivity. If so, the Chotzek must be capable of marvelously accurate perception. It seemed to Waterfield that, somewhere during his traveling study of stellar

civilizations, he had encountered such arrangements.

The Chotzek wore a sturdy harness attached to a two-wheeled tank. A flexible tube leading from this and disappearing beneath the "head" growth indicated that he was not at home in Terran air.

Waterfield realized that Fuller had been talking about him.

"... of course not. Perfectly average individual, as agreed, although he did have some courses at an agricultural college."

Ferris and Taylor looked at Waterfield clinically. The former translated to the Chotzek by a series of grunts.

"Our only interest," Fuller assured them, "is in seeing that your generators can be operated by Terran workers of average intelligence—"

Why, he's as much as calling me a dummy, thought Waterfield resentfully, but realized he had better act the part.

Ferris "spoke" with the Chotzek.

"He says," he reported to Fuller, "he hopes there won't be any more complaints about the generators. We had a little trouble convincin' him an' his friends that anythin' was ever outa order."

"They know about the explosions," reminded Fuller.

"Yeah, but they say the machines musta been handled wrong."

"Are they infallible?" inquired the B. S. T. man.

"Huh!" grunted Taylor. "*They* think so."

"The point is," said Ferris, "they kinda have a good opinion o' themselves. They got the idea they can always sell their stuff some place else."

"Ask him if he is quite certain that the operating instructions were correct," requested Fuller.

The Chotzek's answer, when translated, was to the effect that the instructions had included all the information necessary to anyone who had any business using them. Waterfield suspected that Ferris had, in fact, diplomatically censored the statement. Glancing at Fuller, he judged that the other held the same suspicion.

That warmed him up like a nova, he thought. *He's good, though; hardly shows if you don't notice his neck getting red.*

He supposed that Fuller was justified. After all, who did this little lump think he was? Or was his arrogance designed to obscure the true mediocrity of his wares?

He wondered whether the attitude originated with the Chotzek, or if the two intermediaries merely claimed so for their own purposes.

He was still considering this when the conference ended. The Terrans declined Fuller's invitation to dinner, and escorted their client and his little tank down the hall.

"Too bad," murmured Fuller regretfully. "Still I hardly thought they would be that naive. Shall we try the dining room?"

Waterfield followed him, seeing

visions of B. S. T. waiters and drugged entrees. They reached the oxygen wing dining room, where Fuller enjoyed a hearty meal. His companion, distracted by the squishy sounds passing for conversation at a nearby table of Cagsans, was relieved when Fuller began to describe the scene of his future operations, over the coffee.

A few days later, Waterfield stood on that same scene and watched the big B. S. T. jet disappear in the sky. Fuller had had most of the equipment flown in previously, but had taken the time to see Waterfield safely on the island.

This was an uninhabited speck in the tropics, consisting mainly of an old, second-rate volcano, narrow beaches, and a few miles of jungle.

When he was at last in sole possession of all he could see, Waterfield made another, more leisurely inspection of his domain. Several prefabricated sheds had been hastily erected. In there were the Chotzek radiation generators, six of them. In another was a small shop with a few tools, batteries, and electrical parts. The smallest of all, Waterfield noted with a scowl, was for him. There were a television set for entertainment, one for calling the B. S. T. on the mainland, one chair, one cot, and about one square foot of empty floor.

He took a look at one of the generators, and found it a combination of Chotzek technology and Terran transportation. He hoped it was bolted securely to the platform of the thirty-foot truck. The latter ran on

tracks; which was fitting since the generator had the massive, bulky curves usually associated with deep-space vessels, approach-control pill-boxes at Lunar landing fields, or other heavy construction.

"Those open cabs will be fine when it rains," he snorted.

Tomorrow, he decided, he would spread three or four around the island and see what he could get out of the heavy lenses that pointed to the assortment of reflectors mounted on top. He had a printed set of instructions, translated into Terran, but he expected to spend most of his time with a book of chess problems. There should be a way to rig up a remote control system.

It was six days later when Waterfield stood again near the little cluster of sheds, watching a B. S. T. jet sweep over the shallow bay. Two big freighters flew behind it.

A few minutes later, he met Fuller as the other strode up the beach. The B. S. T. man, already beginning to perspire in the sun, jerked his head toward Waterfield's hut. The jet crews apparently had orders to keep out of the way.

"Now!" said Fuller as they entered the cool dimness of the hut, "you can explain to me what made it necessary to call for me in such language!"

"Well," mumbled Waterfield, remembering he had been somewhat excited, "I was a little disappointed at not getting you personally."

"My secretary refused to quote

you verbatim." Fuller wiped his face with a handkerchief without rumpling his mustache. He sank into the only chair, leaving the bunk for Waterfield. "Until last night, I never knew her to be shocked by anything."

Waterfield wondered about an apology, but Fuller plunged abruptly into another matter.

"What was that glow I saw from the air?" he demanded. "They swore to me the volcano has been dead in the memory of man."

"That was number four, at the other end of the island," Waterfield confessed.

Fuller's ruddy features paled slightly as he considered that.

"How the devil did you get away?" he asked.

"Well . . . as a matter of fact—"

"Don't tell me," murmured Fuller, staring at the mess of radio equipment on the table. "I thought you would be too clever to work in the hot sun."

"A good thing, too!" flared Waterfield, his face—save for the freckles—white with temper.

"What do you mean?"

"What do I mean?" shrilled the little man. "I might have gone up with it! I might have been a little puff of vapor floating over the island by now!"

"Yes, that would be awkward," admitted Fuller. "I never would have known how it happened. As it was, you took data, of course?"

"Why . . . I—"

Fuller clucked his tongue sadly.

"Well, then," suggested Fuller, "suppose you tell me what system you followed. Perhaps we can make deductions."

Waterfield gave up the feeling that something demanding an answer had slipped by, and began to outline his distribution of the generators.

"One was working fairly well, growing a nice patch of corn on bare rock. I treated the beans with number two but I think it's on too high—it's patrolling along the edge of the jungle and producing all sorts of mutations."

"How many are you using?"

"Four, to start with. I . . . er . . . lost number three in the jungle."

Fuller pressed his lips tightly together but said nothing.

"Well, it can go over anything with those tracks," said Waterfield defensively. "I figured out what was going on without needing to go after it."

"And the last one?" asked Fuller.

"Oh. That one I tried to adjust."

"Adjust?"

"I thought it might be a good thing if we could use them to clear out unwanted growths."

There was a moment of silence, marred only by the slight creaking of Fuller's boot as he twisted his foot this way and that in a painstaking inspection of the shiny leather.

"I couldn't help it," complained Waterfield.

"No," said Fuller.

"I only changed the settings very little."

"You certainly cleared the undergrowth."

"You probably think I wasn't scientific about it," accused Waterfield angrily. "You probably think I didn't find out anything!"

"You probably found how to explode a generator," decided Fuller judicially. "But, then . . . we could do that before."

"But you didn't know why. And did you grow any corn on bare lava?"

"No-o-o—or at least I had no reports. Could you do it again, with another generator?"

"No, I couldn't. Nobody could!"

Fuller rose to his feet.

"Then suppose we get the others back to the base here, while we think things over."

"But, listen!" demanded Waterfield, his eyes beginning to water with annoyance.

The B. S. T. man, however, had already stepped out into the harsh sunlight.

"Listen to me!" squawked the little man, trotting after him. "Listen, I know—"

"Just a minute," called Fuller over his shoulder. "I want to have the freighters moved up here."

He hurried down the beach, leaving his experimenter jiggling with repressed anger.

"All right!" muttered Waterfield, nearly blind with frustration. "All right! I thought you were brighter than most, but no! You just brush your mustache neater. Well, if I have to bring those contraptions

back, you'll go along, too! We'll see how much I found out—if we both get back."

Fuller returned in a few minutes, rubbing his hands briskly.

"I have decided to move out," he announced. "The freighters will be here to load the generators when you bring them in."

"Then you might as well see for yourself how they've been working." A note of truculence crept into the little man's tone. "Maybe you could get some idea of what could possibly go wrong."

The sarcasm cast a tiny shadow of tenseness over the blazing sand. Fuller's hard blue stare locked with Waterfield's embittered glance. The challenge was plainer than if spoken.

After a moment, the B. S. T. man spoke in a quiet voice.

"I seldom indulge in a mistake, but I shall make an exception—just for you."

Waterfield rushed into his hut. He emerged with an untidy assembly of radio parts mounted on a piece of plywood and a large dry battery. The latter was circled crudely with a length of rope to serve as a handle. This he passed to Fuller, who accepted the burden in sour silence.

Too sore even to ask why, thought Waterfield. Well, let him stretch a muscle for once! I'd like to see that polish melt.

About twenty minutes later, when they reached the experimental area, the polish seemed to be holding well

enough. There may have been a small blister forming here or there, but if so, it was hidden from view.

Waterfield had followed the beach until they came to the place where lava had once flowed into the sea. Here, he insisted upon heading up the jagged slope so that they could look down on generator number one. It seemed to be performing as promised. On the otherwise bare, wind-swept lava was a patch of young corn about ten yards square. This machine was stationary.

"Are the plants normal?" asked Fuller.

"I didn't feel like sticking my head in there to see," said Waterfield. "Now, when we get around this bulge, you'll see the next one."

They scrambled over a sloping ridge and stopped to rest.

Number two clanked into view from the other end of the disappearing beach. The tracked vehicle lumbered along a beaten trail through the insane variety of lush growth carpeting the flat space between jungle and breakers. When it reached a point below the two men, it halted, pivoted ponderously, and started back.

"Does that grow right to the water's edge?" inquired Fuller.

"I think some of it starts underwater now," Waterfield told him. "The 'beach' seems wider than it used to and those waves don't smash in the way they did."

"All in a week?"

"Yes."

"You must have something mal-

adjusted," declared Fuller. "No wonder. How could you be accurate with that radio gadget?"

Waterfield's freckles slowly became prominent.

"I made manual adjustments on number four," he grated. "I was just lucky. When I saw all the dials creeping the same way no matter what I did, I ran for the mountain. Just got around the bend, too."

Fuller seemed somewhat mollified.

"Well," he suggested finally, "suppose you show me how you handle that one running along the beach."

Waterfield relieved Fuller of the heavy battery. He connected a cable between that and his assembly, fiddled with some knobs, watched the moving machine below, and fiddled some more.

The generator reached the end of its beat as Waterfield worked. It turned in its clumsy fashion, but stopped instead of lumbering away. He jockeyed it over a few yards into a new path and looked to Fuller for instructions.

"How about changing the radiation?" asked his companion.

Waterfield's sneer was as expressive as ever.

"Sure you want me to try?"

Fuller stared at him analytically. "Make just a small change," he suggested.

"I'd rather do that manually," said Waterfield.

They left the equipment there and walked down the slope. Reaching the generator, Waterfield led the way

up a ladder on the end of the Terran-built undercarriage.

The Chotzek apparatus was constructed with a thick shield protecting the control board, at the end near the cab of the truck. Waterfield was aware, as he disconnected his wiring, that Fuller took care not to stand near the edge of this.

"It's all right," said the little man. "I found out those reflectors have safety guides. They can't point this way. Probably can't focus this close anyway."

"Who would want it focused?" murmured Fuller, as he bent to examine the Chotzek controls over Waterfield's shoulder. "Those multiple switches must be clumsy."

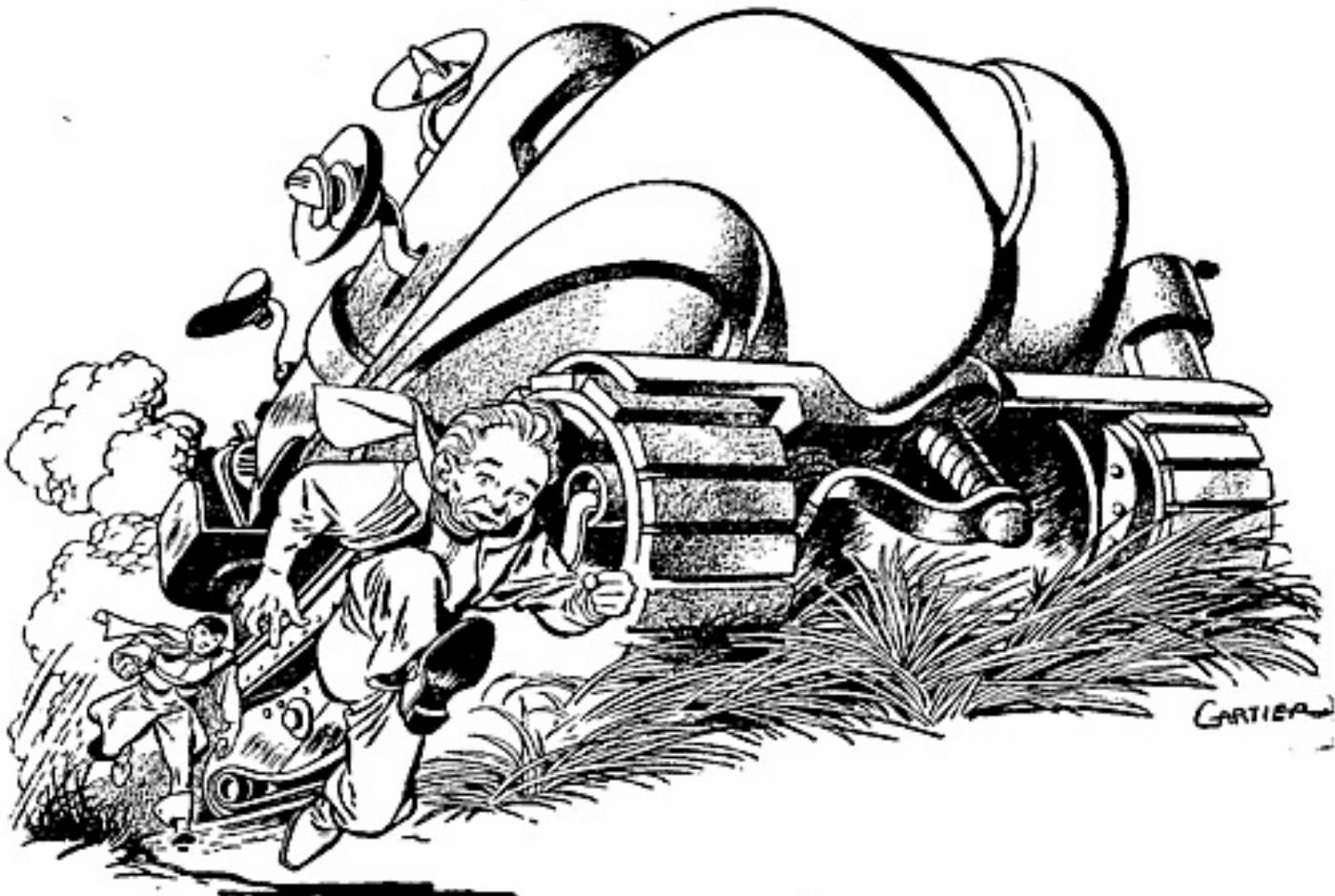
"I could manage those," Waterfield said, forgetting his annoyance temporarily. "What burns me is the way they design indicator dials. That big one has such a fine scale that I can't see exactly which line the arrow points to."

"Neither can I," admitted Fuller. "And these others—are they calibrated in *colors*?"

"That's right. I'm not color-blind, but those hues shade so smoothly from one to another that I don't know what they're telling me half the time."

He moved a handle cautiously. Nothing startling happened; some of the indicators moved lazily.

"Gave it a little more power," he



muttered. "Supposed to match it on this dial, but I can't tell the difference. When I tried this on number four, it burnt all the plants around. I tried to give this less."

They watched the creeping indicators, and Waterfield craned his neck to see if he had inadvertently set any of the reflectors in motion. He felt himself plucked by the sleeve.

"I dislike to appear unduly timid," said Fuller, "but are you sure you did the right thing?"

Waterfield glanced at the B. S. T. representative and followed the other's stare to the lush vegetation upon which the reflectors focused. The plants seemed to be steaming.

He grabbed Fuller by the arm and shoved him off the edge of the platform. Waterfield was only an instant behind him, and landed running. As he reached the first of the lava after thrashing and floundering through the undergrowth partially flattened by his maneuvering of the truck, it occurred to him that he should have told Fuller to come along. About fifty feet up the slope, he reasoned that the other had reached his position of authority only because of keen wits and hair-trigger initiative.

A few moments later, they threw themselves down to rest after rounding the sloping spur of lava. Waterfield nursed a scraped knee, cursed at the flapping hole in his slacks, and wondered if he would get an infection. Fuller smoothed his ruffled

mustache and stared at the little man accusingly.

"Nothing happened," he complained.

Waterfield panted at him.

"Of course," admitted Fuller, "I believe firmly in taking precautions. In my business, it means so much."

They rested a few minutes. Finally Waterfield stirred.

"I s'pose we might take a look," he said. "Anything bad should have happened by now."

"One thing I shall have to do," mused Fuller, "is to censor some films before I turn in my report. I ordered the boys in my small jet to go up and take telephoto pictures of the layout. I hope they missed our little sprint."

As they looked up to search the sky for the jet, Fuller's voice faded out beneath the impact of a tremendous roar. The explosion reached around the curve of the hill to stagger them with an almost solid blast of air. Waterfield, who happened to be facing the sea, saw a blaze of light reflected from the waves, to be replaced by an ominous, ruddy coruscation.

The two men stared at each other, their sense of time paralyzed for an interval. Finally, Fuller reached down for his share of the remote control equipment.

"I believe I have the main orbit now," he said. "We might as well go, I think—"

Later, back at the base, Fuller discussed the matter with Waterfield.

His air crew, although they claimed to have caught the explosion from high altitude, had been sent to try for another shot of the still burning area.

The agent sat crosslegged on the sand of the beach, doodling on a page from his notebook while his men passed back and forth in their work of evacuating the experimental station. Waterfield noticed that many glanced curiously at Fuller. He suspected that few had ever seen their chief slicker so forgetful of appearances as to sit with his jacket unbelted and his neck scarf tied around his head as a sweatband.

"There were two generators never in action," mused Fuller. "They are being shipped now. That leaves on Terra only your number one, and model that went native. Correct?"

"As far as I know," Waterfield shrugged.

Fuller rose, jamming the notebook into his pocket.

"Bring that gadget of yours when we take off," he ordered. "I presume you can scramble the dials enough to be sure of igniting number one?"

Waterfield gaped, but nodded. Before he grasped the intention, the small jet had returned and the others were loaded.

All took off. The two freighters were sent sweeping back over the island to take pictures while Fuller and Waterfield worked with the latter's homemade apparatus.

It did not take much. The generator flared briefly at the center of

an expanding, transparent motion down on the island, and disappeared beneath a rising billow of smoke. Their jet swung away, leaving the others to complete their picture taking, and headed for the mainland.

Waterfield kicked aside his equipment, and Fuller went forward to confer with the pilot. The little man sat down to enjoy the comfortable temperature within the jet. He had not realized he was so tired until he felt the comfort of the seat. Before long, he slept while the jet slashed through the stratosphere.

One of the crew—or he might have been a special agent—awakened Waterfield after they had landed on the mainland. Mr. Fuller had left immediately, but had given orders that Mr. Waterfield could have supper if he wished. There would be a suite at the hotel for Mr. Waterfield, and Mr. Fuller would call there later. Also, there was an envelope addressed to Mr. Waterfield.

The little man opened the envelope, finding a neat packet of kilo-credit bills and a scrawled memo: "For incidental expenses."

After supper, an aircar was placed at his disposal and he was let off at the landing roof of the B. S. T. hotel. He descended to the main floor desk, rewarded a request for identification with a sneer, but was shown to a comfortable suite anyway. He suspected Fuller of having sent a warning description ahead.

By the time Waterfield had made himself thoroughly at home, the

B. S. T. agent arrived with two well-groomed young accomplices.

"I thought we could save time if I met my assistants here," he explained after hastily slurred introductions.

They gathered around the table, upon which Fuller spread photographs apparently enlarged from movies made of the island.

"Now, professor," he requested, "can you pencil off the area most likely to contain the missing number three?"

Waterfield meditated and marked out a section of jungle.

"All right, Lewis," said Fuller. "You know as much about it now as the Bureau can tell you. Order whatever you need in the way of transportation, technicians, and lab equipment. Just see that you set it off and get pictures of the explosion —from as many angles as you can."

He turned to the other man. Waterfield listened to the instructions, puzzled. Then he understood.

All the Chotzek generators were to be reported blown up. There would be moving pictures to verify the accidents. There would be extra casualties to add to the earlier, factual list. There would be some other trade arrangements with the Chotzecks.

"Even though they deserve nothing!" said Fuller indignantly. "At the very least, they took no consideration of our problems, but if they were trying to pass off some rejects on the Bureau—"

"Who?" asked Waterfield.

"Well, I am not quite sure," admitted Fuller. "If it was done by the Chotzecks, those creeping cylinders may simply not care if we blow ourselves up."

"Ferris and Taylor? All we know comes through them."

"I have been considering them. In fact, they will find it extremely difficult to leave Terra until the Bureau is satisfied."

The diplomatic message, however, would merely state that although the generators were useless to Terra, the Chotzecks would be highly esteemed as a trading link to the Center. When this had been copied down, the two young men hustled out, leaving Fuller and Waterfield with one other problem.

"We know they have *something*," the little man said. "We may even be able to build one when we know what it is. But how do you think you're going to analyze the models you swiped?" *

Fuller looked pained at the choice of such a word, and confessed that he had not had time to plan that.

"Neither have I," said Waterfield, "but I know why we'll never operate those gadgets as they are, perfect or rejects as they may be. I had most of the picture on the island, but you wouldn't listen."

Fuller had been busy with glasses and decanter. He passed a drink to Waterfield and sat down facing him.

"Yes," he admitted, "I am seldom that hasty, but I underestimated you, Waterfield. When we were running

around that hill, you were an entirely different person than I had seen in my office. I never thought you had it in you."

Waterfield blinked, then coughed to cover up. Somehow, for the first time in years, he did not resent the omission of a title before his name. He even felt he might approve of the wild orange neck scarf Fuller was wearing with tonight's black and silver jacket.

"I suppose," he said, conscious of the B. S. T. agent's scrutiny, "we were both too busy to consider each other as persons—or personalities, rather."

Fuller nodded, but Waterfield remained conscious of a driving curiosity in the man. He began to feel annoyed.

"It seems regrettable," he added tartly. "I guess it was the chance of the year for me to see a human being act honestly."

Fuller smiled from the mustache down, but his eyes continued to probe.

"You simply care very little for humans, do you?" he remarked. "Perhaps that is why you did such a fine book on contemporary stellar civilizations."

"Oh, you've been checking up again!" sneered Waterfield.

"Some very respected men tell me," said Fuller blandly, "that it is the definitive work on the subject. You may not have been overly successful as a professor, but your researches are being used to good advantage."

"Naturally," growled Waterfield, wishing he had been less gullible about the financial arrangements.

"But to get back to the subject," said Fuller, "how do you explain our failure?"

Waterfield knew he was being lured by the opportunity to show off his cleverness, but took it anyway.

"I remembered the looks of those Chotzeks, and thought they must have extremely sensitive organs of vision and touch, among others. Probably their depth perception is fantastic compared to ours."

"So?"

"When I tried to use their control boards, I decided I might as well be blind. I imagine they could practically name the wave length of any hue they looked at. As a result, running those generators is just too delicate a job for human senses."

"We shall have to build instruments, you mean."

"How?" snorted Waterfield. "You told me you had other technicians work on this. Got any reports?" Fuller grimaced and refilled their glasses. "You managed to pick up two pieces of equipment, but how is any human being going to find out anything about them—except the ignition point?"

"They *are* touchy," said Fuller gloomily, "but there must be some way. If I call back the Chotzeks, I shudder to think of the price they will demand when they see they have me across the jets."

"It wouldn't look too good," admitted Waterfield.

Fuller thought for a moment, then went to the wall visor and ordered a call put through to Ferris.

"No harm in seeing what their attitude is," he remarked.

They had to wait only a few minutes, during which Fuller paced about the room, until the call was completed. Waterfield answered, to be confronted by the lean, worried features of Ferris.

"Fuller there?" the latter asked. At Waterfield's affirmative nod, he continued: "Tell him they're gone!"

"Gone where?" asked Waterfield, puzzled.

"What's that?" demanded Fuller, striding rapidly across the room to the visor.

"Some bright young comet from the B. S. T. came over a little while ago," said Ferris. "All the Chotzecks are back on Luna—don't like our gravity—so like a pair o' dummies, me an' Taylor pass the story on to 'em by long distance."

"Well?" prodded Fuller.

"They pulled out," said Ferris.

"Without any answer?" demanded the B. S. T. man.

"Not exactly," admitted Ferris, his black eyes shifting uncomfortably. "They said they were tired of foolin' around with . . . er . . . people so far behind them. If we couldn't handle their machines, they won't bother with us. They say there's always somebody willin' to buy Chotzek stuff."

"Well, we *are*," protested Fuller.

"We merely want to make sure their product is reliable."

"That ain't the point," Ferris said. "Taylor tried to tell 'em some-thin' like that. They just said they didn't owe us for the blow-ups, 'cause we shouldn't have been tryin' some-thin' too big for us in the first place."

"Is that all? What about the trade agreement?"

"They said Chotzecks don't need one. They were blastin' off right away anyhow."

"But how can we reach them?" demanded Fuller.

"Said they might send another ship in about fifty years. Right now—"

"Well? What did they say?"

"They . . . uh . . . said it's against their principles to waste time with the . . . uh . . . *lower forms*. They seemed kinda sore at me an' Taylor for not tellin' them right in the beginnin' that we were stupid or some-thin'."

In the screen, his face darkened visibly at the memory. In the hotel room, Fuller flushed even more alarmingly.

"It's against WHAT?" he bellowed. "WHO DO THEY . . . who do they think they are?"

By the time he had controlled himself, he was speaking to a dead screen. Ferris, after one alarmed look, had switched off.

Fuller pounded on the operator's signal button, the veins swelling in his neck. Then he thought better of it and turned the visor off. He

tugged at his mustache and began to pace the room.

"No use sending a patrol after them?" asked Waterfield, guessing the other's original impulse.

Fuller threw himself into a chair and poured a drink.

"Not that I can see," he admitted bitterly. "If we had only handled them differently! I'd like to toast those two apes in Sol for not telling me what we had to deal with!"

He emptied his glass without apparent enjoyment.

"I do not mind their policy of *caveat emptor*," he said. "The Bureau expects that. I have no more affection for the Chotzecks than they for me. But the arrogant indifference of them! If we blow ourselves up, it is our fault for not knowing better!"

"Anyhow, that about finishes the deal," said Waterfield.

Fuller groaned.

"The Bureau will probably station me so far out that I shall need a hundred-incher to see Sol. How did you deduce the Chotzek senses, by the way?"

"Just by looking at them," said Waterfield lamely. "I have traveled, you know, and made observations. I never saw anything exactly like them, but I have encountered the general design *somewhere* in the Terran sector—"

Fuller shouted. He leaped out of his chair, knocking his glass to the floor, and grabbed Waterfield by the shoulder.

"Where?" he demanded.

Waterfield looked up at the suddenly sparkling blue eyes and the bristling mustache. He tried to think.

Fuller released his arm and strode impatiently to the wall visor. The other heard him calling his own office and ordering a copy of Professor John Waterfield's "Stellar Civilizations" to be brought to him at the hotel immediately—all eight volumes!

"You keep thinking," he told Waterfield. "I am going down to interview the clerks."

He left the room like a meteor, and his companion ran agitated hands through his rumpled hair as he tried to concentrate.

An hour later, Fuller returned. There was a long list in his hand and a hard look in his eye. Waterfield suspected that an increased efficiency would appear for a time on the staff. He put down the book he had been reading, and removed his feet from the other chair.

"What is that?" asked Fuller curtly.

"A messenger brought these," said Waterfield, indicating the volumes stacked at his feet. "I've been re-reading my chapter on the Fegashites. I can't find anything wrong with it, even today."

Fuller controlled himself rather obviously. He said that he supposed not, and waited.

"Fortunately, I made an excellent index," said Waterfield. "Peoples we want, I think, are Aambors, or Dronari, or maybe even Ronuils."

Fuller looked down his list, explaining that he had squeezed from the clerks downstairs an account of the more unusual visitors at the hotel.

"We are in luck," he announced. "We have a Dronar and a whole group of Ronuils."

"Where does that leave us?"

"The next thing," said Fuller, marking his list carefully, "is to consult my files. If either of these can handle our problem, I want to know what they want, what they owe us, and what they cannot possibly do without."

"I see what you mean," said Waterfield.

"No need for you to bother," said Fuller, although the other had shown no signs of accompanying him to the door. "You stay here and get a night's rest. I may need you in the morning."

"In any case," said Waterfield wistfully, "I . . . uh . . . would be interested—"

Fuller looked back and hesitated. Then he grinned understandingly, and for the first time Waterfield saw the smile reach his eyes.

"Of course," he said, and went out.

Waterfield picked up his book and leaned back. Even after several years, he thought, it made good reading.

The next morning he was having breakfast with an Altairan when Fuller's message reached him. The little octopod, who had left his mobile carriage to sit on the table across

from Waterfield, signaled his regret at terminating the conversation. The Terran replied as best he could with only two hands, and left the table hungry.

Arriving at the Bureau, he found his employer discussing business with two non-Terrans. Waterfield took in the elongated, scaly bodies, the knotty muscles of each one's four multiple-jointed legs, and the corresponding two pairs of tentacles. These were surely from Ronuil IV.

Fuller introduced them by the names of Ulral and Vahreem. Waterfield found the scrutiny of the four eyes placed around the narrow heads less unpleasant than he might have expected. There were complicated sets of antennae to match the eyes, each organ splitting and re-splitting until they almost gave the effect of hair. His glance fell to the digital extremities, and he saw that the same principle was followed. What delicate operations these beings must be able to perform!

Fuller, he realized, was expressing his opinion of the departed Chotzezs. When he ended with a denunciation of the aliens' indifference to the dangers incurred by unwarmed Terrans, Waterfield thought that the visitors seemed unimpressed.

"You seem to think we *were* fools," he accused Vahreem.

"I did not say that," answered the Ronuil politely.

His voice, as used in imitating Terran speech, was a fuzzy, whispering monotone. Waterfield thought that it fitted the Ronuil's

general air of quiet, determined patience.

"Well, *would* you?" the little man persisted.

The Ronuil denied any such intention.

"You mean, not to my face," grumbled Waterfield.

"Not to any part of you," declared Vahreem precisely. "I would not have said it at all. Every Ronuil would realize it. Why should I tell any one else at all?"

Under Fuller's questioning, he admitted that the Chotzek point of view was not entirely alien to the Ronuils. Until the latter race had shrunk in numbers, it had been their custom to regard the individual as insignificant.

"We no longer believe so," he said carefully, "but it is easy to understand how your friends do. It is from a physical confidence. Small need for others; small feeling for them."

"The opposite is to be understood," offered Ulral, "in a race like yours, with its greater talent for communications between individuals, in place of normal sensory ability to analyze the surroundings."

Waterfield wondered what could be called normal.

First the Chotzecks called us morons, he thought, and now you! Well, we've come a long way on what we have!

After polite farewells, the Ronuils took their leave.

"It looks very encouraging," said Fuller when they were alone. "They

do have the sensory perceptions you predicted."

"What did they say when you described the generators?"

Fuller explained that the Ronuils had known of no such invention, but did recognize the elements of the control system. When they had amused themselves by standing across the room from Fuller's desk, and correctly calling lengths of a few millimeters on his scale, he had begun to think that the Chotzecks might at first have been acting in good faith—from their peculiar viewpoint. They had probably not bothered to inquire into the limitations of human senses.

"Like selling an aircar to a blind man?"

"About that," agreed Fuller. "If I had known that, and been able to deal directly with them before they found out too much, I might have talked them into installing some overload relays or whatever protective system we need. Unfortunately, they would never think of any for themselves, and I had a pair of go-betweens confusing the scene."

"What can you do about *them*?" asked Waterfield curiously.

A baleful light glowed momentarily in Fuller's eyes.

"I hired them," he said.

"You what?"

"I engaged them on percentage for a delicate trade mission, being much impressed, I said, by their shrewdness."

"After they spoiled everything?"



"Yes," said Fuller complacently. "The Bureau had a cargo of gim-crack lenses they had to confiscate—would have burned in our atmosphere, in fact. Ferris and Taylor are taking them out to a star I know of, called Kosor. I expect the Kosorians to clean them to a high polish."

"What does that get you?"

"A long hop will keep them out of my orbit for some time. I gave them a crew I trust, so they will surely be back to explain why they lost B. S. T. property. Then I shall give them a second chance, to make

it up. And so on, until they buy their way out of our service or are squeezed dry."

Waterfield cleared his throat and changed the subject.

"How about the Ronuils, then? As I remember, they're a small race, and not too far from Sol."

Fuller confirmed this, adding that it would make them easy to control. Another good point, he explained, was that they would not spread all over the galaxy when he increased food to their barren planet, the only one left of three they had once populated. That had been his bait. The

Ronuils might have been extinct by now, but for subsidization by Terra.

"That sums it up," he finished. "The Bureau has loaded one of the few Ronuil ships on Luna at the moment. They were quite willing to investigate these generators for us—just what they would naturally be interested in. I am already planning terms on which they may use part of what they build. I merely have to brief some B. S. T. men to supervise."

"What if the Chotzeks come back?" asked Waterfield.

Fuller shrugged, his expression turning stubborn.

"Until then, we might as well see if the Ronuils can build these generators, or whether Terrans can do it safely. If we can, refusing us permission will do the Chotzeks no good."

"Maybe they won't like parting with a manufacturing license. You said yourself they probably acted in good faith, from their viewpoint."

"So am I," said Fuller sharply. "Except that I place *my* faith in Terra. And no 'probably' either."

There was no point in starting an argument, Waterfield reflected. Fuller was right. Humanity was still too small a fish in a huge sea to worry about other minnows. The Chotzeks should have been more considerate or more clever.

"You said I could load my own tanks," he reminded Fuller.

The B. S. T. man never twitched an eyelid, but the atmosphere in the

office changed from congratulatory to commercial.

"Of course," he said pleasantly, "the job is not yet complete, but I think I can put through whatever you want."

"Well—"

"Ask at least ten kilocredits. The Bureau can afford it."

"I had in mind," said Waterfield nervously, "the appointment to supervise the research."

"You would have to leave for Ronuil tonight," objected the surprised agent. "Do you want to spend anything from one to ten years where every individual looks like a crowd?"

"I can stand it if I have something to do."

Fuller meditated.

"I do believe you are capable," he murmured. "Also, you would have Ronuil senses to do the delicate investigation; and especially, there is no advantage in spreading the story over too many tongues. Well, why not?"

"I can leave now," said Waterfield, who had had a hard time keeping silent while Fuller convinced himself.

"We are sending the rocket with the Ronuils and the two generators to Luna in about six hours."

"I'll be there," promised Waterfield.

Half an hour later, dizzy with excitement and B. S. T. briefing, he was returned to the hotel. The energetic Fuller had immediately begun to arrange the red tape concern-

ing his leaving the system. The Ronuils had been informed and their Lunar contingent would have quarters ready for him.

Convenient that they're oxygen breathers, he thought.

The rest was simple, if demanding. He had to report only to Fuller and the latter had lined up the widespread network of the Terran Communications Bureau.

All Waterfield had to do, he reminded himself as he showered and dressed, was to keep track of the Ronuil investigations and organize manufacture of whatever they could make.

"Of course," he murmured to himself as he brushed his retreating hair, "the thing is really bigger than that. Why, if . . . hm-m-m, should have had my hair cut . . . why, if some non-Terrans got control of a gadget like this, and made it work, they could charge a cute credit to lease units for our mining colonies and so forth."

He tried on the new yellow neck scarf he had bought on the way back to the hotel. The brilliant color made him look more like a mouse than ever. He discarded it and began to look for his old red one.

"Yessir. Any being or beings in control of producing those generators would be in the pilot's seat. Almost any planet system could use—"

He fell silent abruptly, staring into the mirror with open mouth, the red scarf dangling from his limp hand.

Anyone in control of production—!
An economic stranglehold!

He stood motionless while his thought flickered here and there, probing and testing the possibilities. He thought of all the times he had developed profitable schemes or inventions, only to find himself out in the cold when the money rolled in.

But this! It was perfect. To the Ronuils, he would be the representative of the Bureau of Special Trading, whom they would hardly dare to cross for fear of incurring Terra's economic displeasure. To Terrans, he would be the man with the goods, whose price they would have to meet.

Perhaps Fuller thought he could keep the Ronuils in subjection by forbidding widespread use of the generators in their planetary system.

"What a laugh!" Waterfield told himself.

The Ronuils could probably operate those generators right now. They could copy them, and the Terrans would have to hire Ronuil operators. There were endless possibilities.

He finished throwing a few things into a traveling bag and crammed on top of them the volumes of his book which Fuller had procured.

A few minutes later, following a bellboy to the elevator, he felt regret at the trouble Fuller would have when the Bureau was faced with the situation Waterfield intended to create. The man *had* seemed to understand him, and it was through Fuller that he had at last been given a chance to get on top. He would, he

decided, make it a condition when the time came that J. Gilbert Fuller be the Terran representative.

By the time he met Fuller and the Ronuils at the spaceport, he had planned such seditions that he broke into a sweat when he was handed his papers. No one seemed to notice.

The Ronuils were bidding Fuller and other Terran officials farewell in their patient manner, while the latter were mostly passing out diplomatic compliments or apologizing for inability to speak Ronuili. After being casually mentioned as an economic observer by Fuller, Waterfield gratefully slunk into the background and remained there.

He felt exhilarated, some hours later, when he could look back on Terra from the observation dome of the local rocket. Ever since the take-off, time had dragged, but he was too full of his idea to be bored, or even to sleep.

He went over the scheme again and again during the change to the Ronuil ship on Luna, and felt even better when he could look back on Sol without seeing any planets. About then he began to notice that he was worrying.

Everything seemed foolproof, except that someone on Terra—by now he hesitated even to think Fuller's name—someone might wake up to the possibilities and wonder if any man could be trusted with them.

Two days from Luna, the Ronuil pilot announced that he would begin to work up to interstellar speed.

A couple of days, thought Waterfield, and I'll be beyond anything but a message. Then I'll have a planet and a race to work with!

He decided that he would injure himself if he tried to bite his nails any shorter, and sought sleep in the cabin the Ronuils had furnished for him. They had been quite thoughtful about constructing a stool and writing table he could use, and in adapting a bunk to fit him. Despite the remodeling of the latter, however, he pitched and kicked in an uneasy half-sleep, restrained only by the netting from floating out.

He suffered through one nightmare after another, in each of which he found himself trapped on the brink of escape, or had some prize snatched from him at the last second. Finally, he began to fall—and fall—and fall—

Waterfield woke, and discovered to his immense relief that the pilot had put a spin on the ship.

"Good!" he said aloud. "He must be finished with his astrogating for a while."

It seemed a good idea to go up to the control room and find out how far they had come.

Waterfield made his way along the corridor to the control room. He enjoyed the spin; it gave a little weight to his spare body. He began to plan the organizing of the Ronuil system immediately after his arrival there, but his thoughts kept wandering. In the back of his mind lurked the fear that perhaps he was not yet beyond Fuller's reach.

He reached the control room. There were three Ronuils there. Two waved languid sensory antennae in his direction, but reserved their main attention for their duties.

The third, Vahreem, rose to his four legs and approached the Terran to await orders.

Waterfield strolled casually over behind the astrogator. From what he could make out, they were nearly a light-year from Sol. He was not too sure of his translation of Ronuil writing. It might be wise to cultivate Vahreem for future use.

"May I be of service?" murmured Vahreem.

"No," replied Waterfield. "I merely wanted to check our progress. I must plan our work."

"Yes," agreed Vahreem patiently. "In that connection, perhaps, is a message recorded for you."

"Message?"

"Yes. Televised while you rested, before we gained speed."

"From whom?" demanded Waterfield.

"From the . . . say you 'agent'? Mr. Fuller. He required that we confidential record it. Shall I have the projector sent to your quarters?"

"Yes, do that immediately," ordered Waterfield.

He left the control room abruptly, casting about for an explanation. It could hardly be an order to return, or Fuller would have spoken directly to the Ronuil crew. Was it an ordinary afterthought? Some little hint or advice? Or had Fuller decided the business was too dangerous?

He hurried to his cabin. Within a few minutes, a Ronuil crewman had arrived, set up the projector with its filmed message, and discreetly left.

Waterfield placed the stool on the spaceward side of the cabin, facing the screen, and seated himself against the light centrifugal force of the spin.

"If he made a deal with the Chotzecks," he muttered as he flipped the switch, "he can go reline his jets with something better. I won't stop for that!"

Fuller's ruddy features appeared across a desk as the screen glowed to life. His golden hair and mustache were as immaculate as usual, but there seemed to be a quality of seriousness behind his bland expression.

"Hello, John," he said quietly. "I hope this catches you before the ship picks up enough speed to distort it."

I don't like his look, thought Waterfield.

"As I recall our last conversation," continued Fuller, meticulously realigning a paperweight on his desk, "we agreed to put you in charge of the Ronuil analysis and production of our experimental generators. That was your only request in return for your very valuable services."

"Well, I never accused you of being stingy with expense funds," murmured Waterfield, as Fuller's image paused to inspect the new position of the paperweight.

"Nevertheless," continued the other, apparently satisfied, "I spent

a little time considering the . . . drawbacks of the situation. After carefully weighing the chances for success—which I regard as good—and listing the Terran colonies which we can never maintain profitably without this development, I thought of a possible flaw."

He paused, and Waterfield said to himself:

"He can't get me back. I won't stop now!"

The screen image of Fuller spoke again:

"I expect you will be busy organizing things, and open to sabotage should any of the Ronuils attempt to . . . ah . . . make political use of your work."

"What's he getting at?" Waterfield wondered.

"I have therefore transmitted strict orders that you are not to be disturbed." Fuller gestured casually. "Although, of course, I invited them to consult you at any time for . . . advice . . . on their interstellar relations."

"*He's caught on!*" yelped Waterfield, leaping up.

He remembered his surroundings just in time to fend himself off from the bulkhead and avoid a painful head bruise. He dropped lightly back to the deck in time to hear Fuller say:

"The Bureau has ordered extra agents to Ronuil to make your security air-tight. A number are traveling in your crew, incidentally—but you would hardly be interested in

our routine methods. If you have any trouble, Vahreem will pass your information along to the B. S. T. chief."

He tapped the paperweight lightly with his forefinger while the raging Waterfield muttered curses. Vahreem! He had been thinking of cultivating *Vahreem*!

"Whatever you may think," continued Fuller, looking up again, "I sincerely believe I have made you the best possible repayment. You should get a great deal of amusement and training out of this job. Later, with proper exploitation of your natural cleverness and innocuous appearance, you should go far in the Bureau. Good luck!"

He nodded cheerfully as the film ended.

Waterfield sat staring blankly into the dark screen. He might as well be tied hand and foot. B. S. T. agents under every rock on Ronuil IV! Even in this very crew, although he had not seen a single Terran among them! He was stopped before he had so much as shown any sign of *intending* anything. No wonder the Bureau had a reputation for coming out on top!

"Well," he told himself resignedly, "I suppose I'm not the first one that burgled their vault and had his pockets picked as he was sneaking out the door."

He thought of Ferris and Taylor, on a long curve to Kosor, and wondered whether he had plotted a

course like that for himself. He rose and set the film back to Fuller's last few remarks.

The other's blond and ruddy image looked him amiably in the eye and repeated:

"Whatever you may think, I sincerely believe I have made you the best possible repayment."

This time, with emotions more under control, Waterfield thought he detected a sincerity he had at first ignored.

"The rest is just bait," he muttered, "but it sounds good. He may even mean it, and get me in on a permanent basis."

He switched off the projector and relaxed on his bunk to plan. This should not be too difficult. The Ronuils would be more reasonable to deal with than the Chotzecks, with their self-satisfied lack of a talent for co-operation, and their complete inability to understand Terran opinion

concerning the importance of the individual.

His job was basically simple—to use one sort of alien senses as a tool to translate other alien methods into human terms. He could hardly avoid an important success.

That, Waterfield was beginning to realize, was what he really needed. To be a success among Terrans. To have spent his life among these non-human beings, with their different standards and values, would have been futile. This was the new chance he had been seeking the first time he had met Fuller; now he had better do something more with it than to cause trouble.

"To begin with," he told himself, "I feel as if I could catch up on my sleep."

He enjoyed the strange luxuries of relaxation and confidence. Whatever the sincerity content of the bait, it had gone down smoothly enough.

THE END

IN TIMES TO COME

Time is cramped by space this issue, so we'll confine to a very few remarks what comments we can make. Chan Davis, absent these many moons, is back with the feature short-novel, "The Aristocrat" involving a problem of, in essence, the dignity of the instructor—or should a teacher run the place?

L. Ron Hubbard's back, too, with a new type of hero for the science-fiction field—the professional technician who's normal business is producing impossible miracles offhand on call. This one concerns a subject rare in science-fiction, too—a horse. Remarkable racer he was, to . . .

Raymond F. Jones has a little yarn about a spacesuit, that we recommend to your attention. Nothing big, or important—but more than usual content of fun packed into its five thousand words!

And the article next issue, "Chance Remarks", very appropriately follows an R. F. Jones' story. It was Jones who wrote "Fifty Million Monkeys". "Chance Remarks" reports some very real, basic, and highly interesting research that takes off from just the sort of idea Jones proposed!

THE EDITOR.



HIDE AND SEEK

BY ARTHUR C. CLARKE

It's obvious that, a fight between one man in a space-suit, and a full-fledged space cruiser is, certainly, "no contest". True—but you've got the wrong slant!

Illustrated by Hicks

We were walking back through the woods when Kingman saw the gray squirrel. Our bag was a small but varied one—three grouse, a couple of pigeons and four rabbits—one, I am sorry to say, an infant in arms. And contrary to certain dark forecasts, both the dogs were still alive.

The squirrel saw us at the same moment. It knew that it was marked

for immediate execution as a result of the damage it had done to the trees on the estate, and perhaps it had lost close relatives to Kingman's gun. In three leaps it had reached the base of the nearest tree, and vanished behind it in a flicker of gray. We saw its face once more, appearing for a moment round the edge of its shield a dozen feet from the ground; but

though we waited, with guns leveled hopefully at various branches, we never saw it again.

Kingman was very thoughtful as we walked back across the lawn to the magnificent old house. He said nothing as we handed our victims to the cook—who received them without much enthusiasm—and only emerged from his reverie when we were sitting in the smoking room and he remembered his duties as a host.

"That tree-rat," he said suddenly—he always called them "tree-rats," on the grounds that people were too sentimental to shoot the dear little squirrels—"it reminded me of a very peculiar experience that happened shortly before I retired. Very shortly indeed, in fact."

"I thought it would," said Carson dryly. I gave him a glare; he'd been in the Navy and had heard King-

man's stories before, but they were still new to me.

"Of course," Kingman remarked, slightly nettled, "if you'd rather I didn't—"

"Do go on," I said hastily. "You've made me curious. What connection there can possibly be between a gray squirrel and the Second Jovian War I can't imagine."

Kingman seemed mollified.

"I think I'd better change some names," he said thoughtfully, "but I won't alter the places. The story begins about a million kilometers sunwards of Mars—"

K.15 was a military intelligence operator. It gave him considerable pain when unimaginative people called him a spy, but at the moment he had much more substantial grounds for complaint. For some days now a fast cruiser had been



coming up astern, and though it was flattering to have the undivided attention of such a fine ship and so many highly-trained men, it was an honor that K.15 would willingly have forgone.

What made the situation doubly annoying was the fact that his friends would be meeting him off Mars in about twelve hours, aboard a ship quite capable of dealing with a mere cruiser—from which you will gather that K.15 was a person of some importance. Unfortunately, the most optimistic calculation showed that the pursuers would be within accurate gun range in six hours. In some six hours five minutes, therefore, K.15 was likely to occupy an extensive and still expanding volume of space.

There might just be time for him to land on Mars, but that would be one of the worst things he could do. It would certainly annoy the aggressively neutral Martians, and the political complications would be frightful. Moreover, if his friends had to come down to the planet to rescue him, it would cost them more than ten kilometers a second in fuel—most of their operational reserve.

He had only one advantage, and that a very dubious one. The commander of the cruiser might guess that he was heading for a rendezvous, but he would not know how close it was nor how large was the ship that was coming to meet him. If he could keep alive for only twelve hours, he would be safe. The "if" was a somewhat considerable one.

K.15 looked moodily at his charts, wondering if it was worth while to burn the rest of his fuel in a final dash. But a dash to where? He would be completely helpless then, and the pursuing ship might still have enough in her tanks to catch him as he flashed outwards into the empty darkness, beyond all hope of rescue—passing his friends as they came sunwards at a relative speed so great that they could do nothing to save him.

With some people, the shorter the expectation of life, the more sluggish are the mental processes. They seem hypnotized by the approach of death, so resigned to their fate that they do nothing to avoid it. K.15, on the other hand, found that his mind worked better in such a desperate emergency. It began to work as it had seldom done before.

Commander Smith—the name will do as well as any other—of the cruiser *Doradus* was not unduly surprised when K.15 began to decelerate. He had half expected the spy to land on Mars, on the principle that internment was better than annihilation, but when the plotting room brought the news that the little scout ship was heading for Phobos, he felt completely baffled. The inner moon was nothing but a jumble of rock some twenty kilometers across, and not even the economical Martians had ever found any use for it. K.15 must be pretty desperate if he thought it was going to be of greater value to him.

The tiny scout had almost come to rest when the radar operator lost it against the mass of Phobos. During the braking maneuver, K.15 had squandered most of his lead and the *Doradus* was now only minutes away—though she was now beginning to decelerate lest she overrun him. The cruiser was scarcely three thousand kilometers from Phobos when she came to a complete halt; but of K.15's ship, there was still no sign. It should be easily visible in the telescopes, but it was probably on the far side of the little moon.

It reappeared only a few minutes later, traveling under full thrust on a course directly away from the sun. It was accelerating at almost five gravities—and it had broken its radio silence. An automatic recorder was broadcasting over and over again this interesting message:

"I have landed on Phobos and am being attacked by a Z-class cruiser. Think I can hold out until you come, but hurry."

The message wasn't even in code, and it left Commander Smith a sorely puzzled man. The assumption that K.15 was still aboard the ship and that the whole thing was a ruse was just a little too naive. But it might be a double-bluff—the message had obviously been left in plain language so that he would receive it and be duly confused. He could afford neither the time nor the fuel to chase the scout if K.15 really had landed. It was clear that reinforcements were on the way, and the

sooner he left the vicinity the better. The phrase "Think I can hold out until you come" might be a piece of sheer impertinence, or it might mean that help was very near indeed.

Then K.15's ship stopped blasting. It had obviously exhausted its fuel, and was doing a little better than six kilometers a second away from the sun. K.15 must have landed, for his ship was now speeding helplessly out of the solar system. Commander Smith didn't like the message it was broadcasting, and guessed that it was running into the track of an approaching warship at some indefinite distance, but there was nothing to be done about that. The *Doradus* began to move towards Phobos, anxious to waste no time.

On the face of it, Commander Smith seemed the master of the situation. His ship was armed with a dozen heavy guided missiles and two turrets of electromagnetic guns. Against him was one man in a spacesuit, trapped on a moon only twenty kilometers across. It was not until Commander Smith had his first good look at Phobos, from a distance of less than a hundred kilometers, that he began to realize that, after all, K.15 might have a few cards up his sleeve.

To say that Phobos has a diameter of twenty kilometers, as the astronomy books invariably do, is highly misleading. The word "diameter" implies a degree of symmetry which Phobos most certainly

lacks. Like those other lumps of cosmic slag, the asteroids, it is a shapeless mass of rock floating in space, with, of course, no hint of a atmosphere and not much more gravity. It turns on its axis once every seven hours thirty-nine minutes, thus keeping the same face always to Mars—which is so close that appreciably less than half the planet is visible, the Poles being below the curve of the horizon. Beyond this, there is very little more to be said about Phobos.

K.15 had no time to enjoy the beauty of the crescent world filling the sky above him. He threw all the equipment he could carry out of the air lock, set the controls, and jumped. As the little ship went flaming out towards the stars he watched it go with feelings he did not care to analyze. He had burned his boats with a vengeance, and he could only hope that the oncoming battleship would intercept the radio message as the empty vessel went racing by into nothingness. There was also a faint possibility that the enemy cruiser might go in pursuit, but that was rather too much to hope for.

He turned to examine his new home. The only light was the ochre radiance of Mars, since the sun was below the horizon, but that was quite sufficient for his purpose and he could see very well. He stood in the center of an irregular plain about two kilometers across, surrounded by low hills over which he could

leap rather easily if he wished. There was a story he remembered reading long ago about a man who had accidentally jumped off Phobos; that wasn't quite possible—though it was on Deimos—as the escape velocity was still about ten meters a second. But unless he was careful, he might easily find himself at such a height that it would take hours to fall back to the surface—and that would be fatal. For K.15's plan was a simple one—he must remain as close to the surface of Phobos as possible *and diametrically opposite the cruiser*. The *Doradus* could then fire all her armament against the twenty kilometers of rock, and he wouldn't even feel the concussion. There were only two serious dangers, and one of these did not worry him greatly.

To the layman, knowing nothing of the finer details of astronautics, the plan would have seemed quite suicidal. The *Doradus* was armed with the latest in ultra-scientific weapons; moreover, the twenty kilometers which separated her from her prey represented less than a second's flight at maximum speed. But Commander Smith knew better, and was already feeling rather unhappy. He realized, only too well, that of all the machines of transport man has ever invented, a cruiser of space is far and away the least maneuverable. It was a simple fact that K.15 could make half a dozen circuits of his little world while her commander was persuading the *Doradus* to do even one.

There is no need to go into technical details, but those who are still unconvinced might like to consider these elementary facts. A rocket-driven spaceship can, obviously, only accelerate along its major axis—that is, “forwards”. Any deviation from a straight course demands a physical turning of the ship, so that the motors can blast in another direction. Everyone knows that this is done by internal gyros or tangential steering jets—but very few people know just how long this simple maneuver takes. The average cruiser, fully fueled, has a mass of two or three thousand tons, which does not make for rapid footwork. But things are even worse than this, for it isn’t the mass, but the moment of inertia that matters here—and since a cruiser is a long, thin object, its moment of inertia is slightly colossal. The sad fact remains—though it is seldom mentioned by astronautical engineers—that it takes a good ten minutes to rotate a spaceship through one hundred eighty degrees, with gyros of any reasonable size. Control jets aren’t much quicker, and in any case their use is restricted because the rotation they produce is permanent and they are liable to leave the ship spinning like a slow-motion pinwheel, to the annoyance of all inside.

In the ordinary way, these disadvantages are not very grave. One has millions of kilometers and hundreds of hours in which to deal with such minor matters as a change in the ship’s orientation. It is defi-

nitely against the rules to move in ten-kilometer radius circles, and the commander of the *Doradus* felt distinctly aggrieved. K.15 wasn’t playing fair.

At the same moment that resourceful individual was taking stock of the situation, which might very well have been worse. He had reached the hills in three jumps and felt less naked than he had out in the open plain. The food and equipment he had taken from the ship he had hidden where he hoped he could find it again, but as his suit could keep him alive for over a day that was the least of his worries. The small packet that was the cause of all the trouble was still with him, in one of those numerous hiding places a well-designed space-suit affords.

There was an exhilarating loneliness about his mountain aerie, even though he was not quite as lonely as he would have wished. Forever fixed in his sky, Mars was waning almost visibly as Phobos swept above the night side of the planet. He could just make out the lights of some of the Martian cities, gleaming pin-points marking the junctions of the invisible canals. All else was stars and silence and a line of jagged peaks so close it seemed he could almost touch them. Of the *Doradus* there was still no sign. She was presumably carrying out a careful telescopic examination of the sunlit side of Phobos.

Mars was a very useful clock—

when it was half full the sun would rise and, very probably, so would the *Doradus*. But she might approach from some quite unexpected quarter; she might even—and this was the one real danger—have landed a search party.

This was the first possibility that had occurred to Commander Smith when he saw just what he was up against. Then he realized that the surface area of Phobos was over a thousand square kilometers and that he could not spare more than ten men from his crew to make a search of that jumbled wilderness. Also, K.15 would certainly be armed.

Considering the weapons which the *Doradus* carried, this last objection might seem singularly pointless. It was very far from being so. In the ordinary course of business, side arms and other portable weapons are as much use to a space-cruiser as are cutlasses and crossbows. The *Doradus* happened, quite by chance—and against regulations at that—to carry one automatic pistol and a hundred rounds of ammunition. Any search party would, therefore, consist of a group of unarmed men looking for a well concealed and very desperate individual who could pick them off at his leisure. K.15 was breaking the rules again.

The terminator of Mars was now a perfectly straight line, and at almost the same moment the sun came up, not so much like thunder as like a salvo of atomic bombs. K.15 adjusted the filters of his visor and de-

cided to move. It was safer to stay out of the sunlight, not only because he was less likely to be detected in the shadow but also because his eyes would be much more sensitive there. He had only a pair of binoculars to help him, whereas the *Doradus* would carry an electronic telescope of twenty centimeters aperture at least.

It would be best, K.15 decided, to locate the cruiser if he could. It might be a rash thing to do, but he would feel much happier when he knew exactly where she was and could watch her movements. He could then keep just below the horizon, and the glare of the rockets would give him ample warning of any impending move. Cautiously launching himself along an almost horizontal trajectory, he began the circumnavigation of his world.

The narrowing crescent of Mars sank below the horizon until only one vast horn reared itself enigmatically against the stars. K.15 began to feel worried—there was still no sign of the *Doradus*. But this was hardly surprising, for she was painted black as night and might be a good hundred kilometers away in space. He stopped, wondering if he had done the right thing after all. Then he noticed that something quite large was eclipsing the stars almost vertically overhead, and was moving swiftly even as he watched. His heart stopped for a moment—then he was himself again, analyzing the situation and trying

to discover how he had made so disastrous a mistake.

It was some time before he realized that the black shadow slipping across the sky was not the cruiser at all, but something almost equally deadly. It was far smaller, and far nearer, than he had at first thought. The *Doradus* had sent her television-homing guided missiles to look for him.

This was the second danger he had feared, and there was nothing he could do about it except to remain as inconspicuous as possible. The *Doradus* now had many eyes searching for him, but these auxiliaries had very severe limitations. They had been built to look for sunlit spaceships against a background of stars, not to search for a man hiding in a dark jungle of rock. The definition of their television systems was low, and they could only see in the forward direction.

There were rather more men on the chessboard now, and the game was a little deadlier, but his was still the advantage. The torpedo vanished into the night sky. As it was traveling on a nearly straight course in this low gravitational field, it would soon be leaving Phobos behind, and K.15 waited for what he knew must happen. A few minutes later, he saw a brief stabbing of rocket exhausts and guessed that the projectile was swinging slowly back on its course. At almost the same moment he saw another flare far away in the opposite quarter of the sky, and wondered just how many

of these infernal machines were in action. From what he knew of Z-class cruisers—which was a good deal more than he should—there were four missile control channels, and they were probably all in use.

He was suddenly struck by an idea so brilliant that he was quite sure it couldn't possibly work. The radio on his suit was a tunable one, covering an unusually wide band, and somewhere not far away the *Doradus* was pumping out power on everything from a thousand megacycles upwards. He switched on the receiver and began to explore.

It came in quickly—the raucous whine of a pulse transmitter not far away. He was probably only picking up a subharmonic, but that was quite good enough. It D/F'ed sharply, and for the first time K.15 allowed himself to make long-range plans about the future. The *Doradus* had betrayed herself—as long as she operated her missiles, he would know exactly where she was.

He moved cautiously forward towards the transmpter. To his surprise the signal faded, then increased sharply again. This puzzled him until he realized that he must be moving through a diffraction zone. Its width might have told him something useful if he had been a good enough physicist, but he couldn't imagine what.

The *Doradus* was hanging about five kilometers above the surface, in full sunlight. Her "nonreflecting" paint was overdue for renewal, and K.15 could see her clearly. As

he was still in darkness, and the shadow line was moving away from him, he decided that he was as safe here as anywhere. He settled down comfortably so that he could just see the cruiser and waited, feeling fairly certain that none of the guided projectiles would come too near the ship. By now, he calculated, the commander of the *Doradus* must be getting pretty mad. He was perfectly correct.

After an hour, the cruiser began to heave herself round with all the grace of a bogged hippopotamus. K.15 guessed what was happening. Commander Smith was going to have a look at the antipodes, and was preparing for the perilous fifty kilometer journey. He watched very carefully to see the orientation the ship was adopting, and when she came to rest again was relieved to see that she was almost broadside on to him. Then, with a series of jerks that could not have been very enjoyable aboard, the cruiser began to move down to the horizon. K.15 followed her at a comfortable walking pace—if one could use the phrase—reflecting that this was a feat very few people had ever performed. He was particularly careful not to overtake her on one of his kilometer-long glides, and kept a close watch for any missiles that might be coming up astern.

It took the *Doradus* nearly an hour to cover the fifty kilometers. This, as K.15 amused himself by calculating, represented considerably

less than a thousandth of her normal speed. Once she found herself going off into space at a tangent, and rather than waste time turning end over end again fired off a salvo of shells to reduce speed. But she made it at last, and K.15 settled down for another vigil, wedged between two rocks where he could just see the cruiser and he was quite sure she couldn't see him. It occurred to him that by this time Commander Smith might have grave doubts as to whether he really was on Phobos at all, and he felt like firing off a signal flare to reassure him. However, he resisted the temptation.

There would be little point in describing the events of the next ten hours, since they differed in no important detail from those that had gone before. The *Doradus* made three other moves, and K.15 stalked her with the care of a big-game hunter following the spoor of some elephantine beast. Once, when she would have led him out into full sunlight, he let her fall below the horizon until he could only just pick up her signals. But most of the time he kept her just visible, usually low down behind some convenient hill.

Once a torpedo exploded some kilometers away, and K.15 guessed that some exasperated operator had seen a shadow he didn't like—or else that a technician had forgotten to switch off a proximity fuze. Otherwise nothing happened to enliven the proceedings; in fact, the whole affair was becoming rather boring. He almost welcomed the

sight of an occasional guided missile drifting inquisitively overhead, for he did not believe that they could see him if he remained motionless and in reasonable cover. If he could have stayed on the part of Phobos exactly opposite the cruiser, he would have been safe even from these, he realized, since the ship would have no control there in the moon's radio-shadow. But he could think of no reliable way in which he could be sure of staying in the safety zone if the cruiser moved again.

The end came very abruptly. There was a sudden blast of steering jets, and the cruiser's main drive burst forth in all its power and splendor. In seconds the *Doradus* was shrinking sunwards, free at last, thankful to leave, even in defeat, this miserable lump of rock that had so annoyingly balked her of her legitimate prey. K.15 knew what had happened, and a great sense of peace and relaxation swept over him. In the radar room of the cruiser, someone had seen an echo of disconcerting amplitude approaching with altogether excessive speed. K.15 now had only to switch on his suit beacon and to wait. He could even afford the luxury of a cigarette.

"Quite an interesting story," I said, "and I see now how it ties up with that squirrel. But it does raise one or two queries in my mind."

"Indeed?" said Rupert Kingman politely.

I always like to get to the bottom

of things, and I knew that my host had played a part in the Jovian War about which he very seldom spoke. I decided to risk a long shot in the dark.

"May I ask how you happened to know so much about this unorthodox military engagement? It isn't possible, is it, that *you* were K.15?"

There was an odd sort of strangling noise from Carson. Then Kingman said, quite calmly:

"No, I wasn't."

He got to his feet and started towards the gun room.

"If you'll excuse me a moment, I'm going to have another shot at that tree-rat. Maybe I'll get him this time." Then he was gone.

Carson looked at me as if to say: "This is another house you'll never be invited to again." When our host was out of earshot he remarked in a coldly clinical tone:

"What did you have to say that for?"

"Well, it seemed a safe guess. How else could he have known all that?"

"As a matter of fact, I believe he met K.15 after the war; they must have had an interesting conversation together. But I thought you knew that Rupert was retired from the service with only the rank of lieutenant commander. The Court of Inquiry could never see his point of view. After all, it just wasn't reasonable that the commander of the fastest ship in the Fleet couldn't catch a man in a spacesuit."

THE

END

CYBERNETICS

BY E. L. LOCKE

Machines do not—yet!—think. But they begin to display neurological symptoms—and after all, animals don't think. Cybernetics is a double-ended approach to the twin mysteries: how can we make a machine think—and how does the thinking machine we have, the brain, work?

The birth of a new science is seldom a well heralded event. Its initial growth is generally so slow that for a long time only a few specialists are aware of its existence. However, once in a blue moon, the importance of a new idea is so evident and its development is so rapid that the world quickly becomes aware of it.

The case in point is the new science which has been brought to the public's attention through the publication of the book "Cybernetics,"*

*John Wiley and Sons: pp. 194, \$3.00
by Norbert Wiener, Professor of Mathematics at MIT. Its subtitle, "Control and Communication in the Animal and the Machine" indicates that the new science deals with the common elements in the functioning of automatic and living machines. It thus straddles the physical sciences

and the sciences of life. More specifically, it is an infusion of the basic concepts of communication and control engineering into the fields of physiology, psychiatry and psychology. So at least is the view of Professor Wiener. Others, however, feel that its scope is even broader and that the concepts are not restricted to the study of the individual but are also applicable to social groups. Attempts have already been made to apply the principles to sociology, public opinion surveys, anthropology, ecology and other fields.

The name, cybernetics, is derived from the Greek word "kybernetes" meaning steersman. Its suggestiveness is more apparent if we note that its Latin equivalent is "governator" meaning governor. The name thus implies that the science deals with

the processes and means used to control the machine, human or otherwise.

The idea that living organisms can be described in terms of physical concepts has always been resisted by the vitalists. Thus, in the early days of chemistry, it was maintained that organic compounds could never be produced artificially. During the nineteenth century some biologists made attempts to apply the physics of the time to their problem. The dominant notion of physics was *energy*. The attempt to explain biology in these terms failed, to the great satisfaction of the vitalists. To quote the views held in 1885 by one of the leading biologists:

"... to the enlightened biologist a living organism does not present a problem for analysis, it is axiomatic. Its essential attributes are axio-

matic; heredity, for example, is for biology not a problem but an axiom."

The vitalists are still with us. In 1946 at a meeting where results obtained by cybernetic methods were presented, one of the listeners made a little speech to the effect that in 1841, XYZ said that living processes could not possibly be studied through the application of physical sciences and by heck, that was still good enough for him. So we may expect that Professor Wiener's views will meet with opposition from the traditionalists and the authoritarians. It is therefore encouraging to note that among his co-workers and followers are numbered some of the most outstanding men in the biological sciences.

If we take the point of view that a living organism is purposeful and goal seeking—teleological—then its

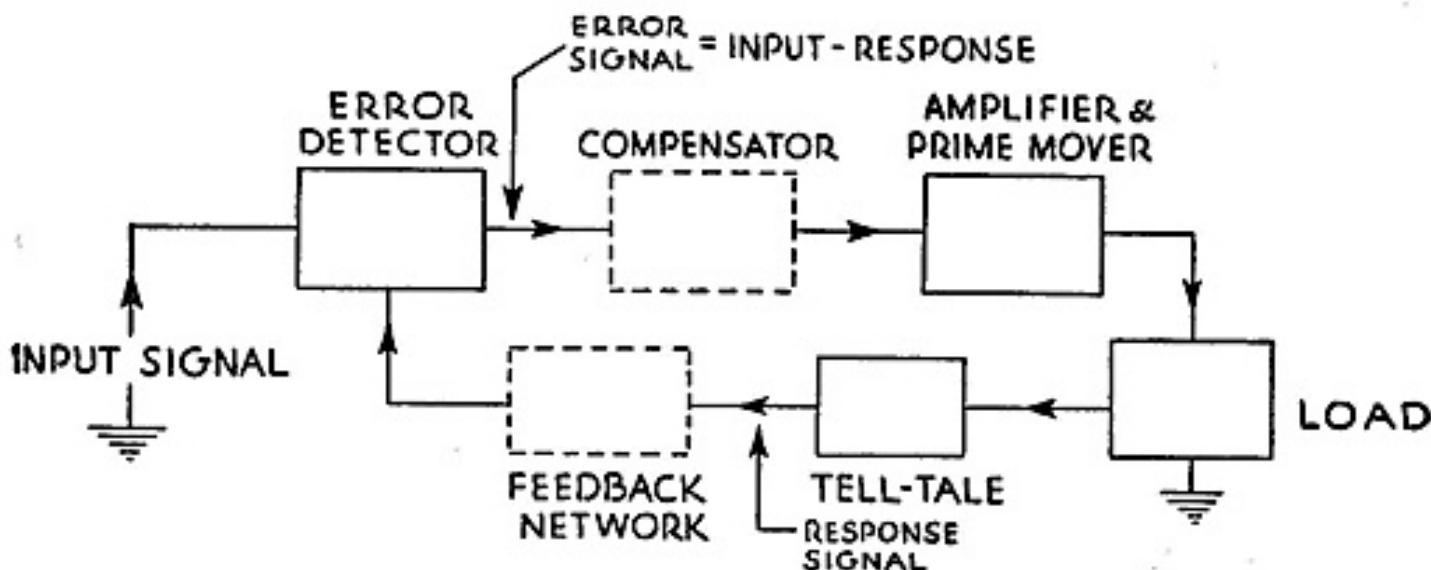


FIG. 1

behavior must depend on the information its senses bring it. The basic mechanism that the organism uses to attain its goal is *feedback*.

The notion of what is meant by information has been reduced by Wiener, Shannon of the Bell Telephone Laboratories and others to an exact mathematical theory. It is a fascinating study in itself and has uncovered some startling and extremely valuable ideas on electrical communication. In his book, Professor Wiener devotes a chapter to it, one of the toughest to read, incidentally. However, it is not absolutely essential for our purposes to go into it further and we shall turn now to an examination of the feedback concept.

It seems to be one of those rare concepts that science is always looking for; one that will unify broad but apparently unrelated fields. Like so many other concepts, it had its origin in engineering needs. Troubles with the steam engine governor, a negative feedback mechanism, resulted in a classical analysis by the great Clerk Maxwell. There the matter lay forgotten until 1924 when H. S. Black of the Bell Telephone Laboratories invented the negative feedback amplifier for reducing the distortion produced by telephone amplifiers.

There were a lot of troubles initially with these feedback amplifier designs, because they turned out to be unstable. That is, they broke into

spontaneous oscillation. However, Nyquist of Bell Telephone Laboratories evolved an analytical test which would predict whether a design would be stable or not. Somewhat later, Bode, also of B. T. L. solved the converse problem, the synthesis of systems which were guaranteed to be stable. Under the needs created by the war, these principles were applied to control engineering which up to that time had been on a hit or miss basis. Since some of the most striking engineering examples of feedback occur in this field, let us use one of its examples, a gun drive servomechanism.

Suppose you had the problem of continuously pointing a heavy gun at a rapidly moving target, given a computing device which, instant by instant, tells you the proper direction to point the gun. Let us assume also that a powerful electric motor is available to furnish the motive power to the gun, and, to make it easy, the computer puts out its solution in the form of an electrical signal.

The obvious thought is to connect the computer output to the gun drive motor. The first difficulty to occur is that the energy in the computer signal is not enough to drive the gun motor. Hence, as the first requirement, you must put an amplifier between the computer and the motor.

You now have what is called an open-cycle system. It works but only after a fashion. For example if the friction of the gun bearings increases above normal, the gun posi-

tion will lag behind the signal. You then discover the second requirement, the need to monitor the gun position and compare its actual position, each instant, with what the computer says it should have been. Now that the *error* is known, it can be corrected. It is necessary only to amplify the error signal enough to run the motor.

This now gives a closed-cycle system. The arrangement is shown schematically in Figure 1. *The load is driven by the prime mover. A suitable telltale is attached to the load. This monitors the response of the load and puts out a suitable signal proportional to the load's position. This goes to the error detector which *subtracts* the response from the input, forming the *error signal*. This is then amplified enough to run the motor. In many cases additional structures may be interposed in the loop to correct for the peculiarities of the load and the amplifier-prime mover combination. All these elements are collectively called a *feedback loop*.

If the motor element is powerful and fast enough in its response, and the amplification is great enough, the motion of the load will be a very accurate copy of the input signal. Since the response signal is made to *oppose* the input signal, the system is said to have negative feedback. The great advantage of such systems is that a signal can be reproduced accurately at a very high power level, without the performance being sens-

ibly affected by reasonable variations in load, fluctuations of the power supply, et cetera.

This is all very fine except for one thing; the feedback does not stay negative but eventually turns positive. Let us see what we mean by the word "eventually" and what can happen when the feedback turns positive.

Imagine that a momentary disturbance arises within the loop. The amplifier intensifies it and passes it on to the motor. If the motor is fast in its response and forces the load to follow this amplified disturbance, then the telltale will pass this on to the amplifier. The load then receives a larger nudge which is then repeated and amplified, et cetera. Eventually the load is no longer under the control of the input signal. Instead, it will settle into an oscillatory motion of ever increasing amplitude, which may destroy the mechanism if unchecked.

This is a case of uncontrolled positive feedback. Positive feedback can not be prevented, but by proper design can be made harmless. The key to this is that the trouble occurred because the response was too good to very brief disturbances, or, as the engineers say, its high-frequency response was too good. The best cure is to use compensators and feedback networks so designed that they attenuate these high frequencies more than the amplifier intensifies them. If proper attention is paid

to Nyquist's criterion in designing these networks, a disturbance will be weakened with each round trip around the loop and will eventually die out. How soon this happens depends on the goodness of the design.

It must not be assumed that feedback systems can have only one loop. Indeed, as is the case with the automatic steering of ships, it can be proved that two loops are needed to achieve stability. The feedback systems in the human body have many loops. Apparently the only reason why greater engineering use is not made of multi-loop systems is that they are too hard to design.

How do these concepts apply to body processes? Let us start with some simple act of volition such as picking up a glass of water. We do not and probably could not call the successive muscles into play by conscious will. What happens is that our eye and our sense of feel report to the brain how far we are from our goal. This is the error signal which goes to the nervous system. The motion is then directed to go on in such a direction as to reduce the error signal toward zero. In addition to the main feedback loop, eye—nervous system—muscle—glass of water—eye, there are minor loops which co-ordinate the muscles of the several joints involved in the motion. These feedbacks are also on a subconscious level and are called postural feedbacks. The nervous system is the monitor which sees to it that the motion is completed.

These feedback systems are subject to the same troubles that a poorly designed feedback device can fall heir to. For instance, suppose that in Figure 1 the error signal path is opened by a break in the connection. This has a well known counterpart in the affliction known as *tabes dorsalis*. Though the patient's muscles are in good order he can not walk without being ordered. Even then he walks in a peculiar manner with his eyes watching his leg motion. His trouble is that the part of the spinal cord which carries the error signal has been destroyed by syphilis. To monitor his walking he has to rely on his eyes and sense of balance.

There are cases of positive feedback. We have mentioned that in a machine this results in an oscillatory motion that successively overshoots and then undershoots, et cetera. The counterpart in the human being is known as *purpose tremor*. Hand its victim a glass of water and he will go into such violent oscillations in attempting to get it to his mouth that it will spill completely. The trouble here has been tracked down to damage to the cerebellum—lower brain—which has the job of proportioning the muscular response to the error signal.

As Wiener says, this point of view is much broader than that currently held by neurophysiologists. In their view, the central nervous system is a self-contained organ

which receives information from the sensory organs and then orders the muscles to perform. In the language of the control engineer, this would be an open-cycle process. Actually it is a circular or feedback process, the path being "nervous system to muscle to sense organ to nervous system". From what has been said on the gun problem, it is clear that there is all the difference in the world between the two processes.

These ideas are more than mere theories. For instance, muscles can go into uncontrolled vibration under certain pathological conditions. This disease, known as *clonus*, has been analyzed by Wiener using feedback theory. He predicted certain frequencies and amplitudes of vibration as a function of the tension in the muscle. These results were in good agreement with measured values.

Among other feedback processes in the body, the regulatory-homeostatic-ones are worth noting. The regulation of body temperature, hydrogen ion concentration in the blood, blood pressure, the calcium metabolism, the elimination of waste products, are some examples of feedback processes. They differ from the postural feedbacks in that the homeostatic ones are much slower. This is because the effectors must move faster than the glands and smooth muscles.

One of the important contributions of Cybernetics is its recognition that there are fundamental similarities between the body processes

and modern computing machines. There are two broad classes of these machines, analog and digital.* In

* See "Modern Calculators," by E. L. Locke, *Astounding Science Fiction*, January, 1949.

the first type, we build a physical device whose laws of performance are the same as the equations we wish to solve. In the second type, we reduce the problem to arithmetical operations and the machine performs the required operations in accordance with the instructions that have been put into its memory. In most such machines, the numbers are represented in the binary system. This uses only two digits, 0 and 1. This has the great advantage that the digit 1 can be represented by a simple electrical pulse and the digit zero by the absence of a pulse.

The body abounds in analog type mechanisms, generally of the homeostatic type. The central nervous system, however, works much like a digital machine. The basic element of the machine is the *relay*. This is a device that can exist in one of two states, off or on. If a pulse comes in, the relay operates and repeats the pulse. In the latest machines, the relay element is the electron tube, an extremely fast operating device. The corresponding element in the human body is the *neuron* or nerve cell. It is very much smaller than the artifact but it is also very much slower. Each neuron can receive pulses from other neurons through nerve fibers at points of contact called *synapses* of which there may be as many as several hundred or perhaps just a few per neuron.

Like all relays, the neuron is an all or none proposition. It is either at rest or firing, that is, delivering a pulse. It has a certain threshold which must be exceeded if the neuron is to fire. The size of the excess has no effect on the delivered pulse. The firing period is followed by a refractory period during which the neuron recuperates. To use a homey simile, its cycle is just like that of the flush toilet.

The digital computer has two kinds of memory, permanent and temporary. The latter stores information on a yes-no basis by pulses circulating in a closed loop, the pulses being regenerated once per round trip. In the human brain the permanent memory is made up of neuron groups whose thresholds have been altered by the stimuli received. There is also a circulating memory in which pulses circulate over long chains of neurons. These store what Wiener calls the "specious present".

In general, the human brain corresponds to a digital machine plus its instructions. The fact that there have been proposed logical machines to carry out logical operations, strengthens the parallelism. Wiener has some interesting things to say in this connection about the relation of human logic to psychology. This is quite plausible since all logic is limited by the capabilities of the mind. He further observes that machines could be made to exhibit conditioned reflexes. As a matter of fact, since the publication of the

book such a machine has been built.*

*"The Homeostat" by W. R. Ashby, *Electronic Engineering*, Dec. 1948.

Briefly, it contains four identical servomotors, each with its own local feedback loop. The output of each servo acts as an input to each of the other three. Thus the machine is a rather complicated multiloop feedback system. The amount of feedback from one servo to another can be set manually. In general, the system goes wild for arbitrary feedbacks. However, it is possible to cut over to a condition where the feedbacks themselves are under the control of the servos. That is, if the servos are in an unstable condition, a relay turns over to the servos the job of readjusting the feedbacks to suit their own convenience. The remarkable thing that happens then is that eventually all the servos settle down to equilibrium. If now one or more feedbacks are reversed in sign, or a pair of shafts are rigidly coupled together, or if a number of other things are done, the servos always find new feedback settings for themselves that restore equilibrium. The machine always adjusts itself to its new environment! This certainly would be a conditioned reflex except for one thing, the absence of a memory. The lack of this makes the machine forget its past adjustments. This defect is not irremediable. Large scale machines of this sort would be capable of learning and even of original thought.

How does the brain avoid the cruder sorts of blunders that could

arise from the malfunctioning of individual cells? Again, consideration of the computing machine sheds light on this problem. In modern machines the problems solved are so complicated that perhaps as many as a billion operations may be required to get the answer. Despite the fact that electronic equipment is remarkably reliable, the chance of failure is by no means negligible. Accordingly, in some machines the calculations are carried on in parallel on two distinct units. Were it not for the cost, three would be even better because in the case of disagreement, the acceptance of majority rule would permit the solution to go on. This is what happens in the brain. No important operation is assigned to a single neural mechanism. At a certain level of the nervous system, an incoming message proceeds to the next level by more than one member of the general group of channels known as the *internuncial pool*.

When psychopathological disorders occur, there is frequently no observable damage to any specific tissue. It is true, however, that brain tumors, clots, and certain diseases are accompanied by mental disturbances. In Wiener's opinion, the first type of mental disturbance is due to the circulating memory getting out of kilter. When this happens, the other communication channels are overloaded and the trouble symptoms appear.

The circulating memory is the storage of pulses by circulating them

in long neuron chains. These pulses either die out in the course of time or pull in more and more neurons from the internuncial pool. The former is the normal case that occurs in stable feedback systems. In the latter case we have what are called anxiety neuroses. So many neurons are drawn into the process that not enough are left over to carry on the normal processes of thought. Since there is less going on in the brain, these cells are pulled in too, affecting the permanent memory. The similarity of this to what we have said about accidental disturbances in an unstable feedback system is obvious. Just as with the machine, this accidental reversal of stability builds up until the ordinary mental life is destroyed.

When a normally stable machine becomes unstable, we can frequently make it snap out of its psychosis by stopping and clearing it or by kicking it, either with our foot or perhaps by an electrical shock. If the worst comes to the worst, we can remove the defective part. The human brain can not be completely cleared except by death. The nearest practical scheme is to go to sleep. This is why problems look different to us after we have slept on them. Where deeper memories are affected, metrazol or electrical shock is used or in an extreme case, surgery or mental therapy.

Of all living organisms, man is the most subject to mental disorders. This is because he has the longest

neuron chains of any creature. It is also known that the long chains are associated with the so-called higher processes. It is a truism that the more elements there are in a chain, the greater is the likelihood of failure. These facts suggest that the human system is inadequately equipped with long distance channels. This gives rise to traffic problems much like those encountered in automatic telephone exchanges. These function very well indeed just up to overload. In the human being overloads occur because there may be more traffic than lines to handle them, or because certain channels are taken out of service by disease, or again because too many channels are carrying harmful traffic like pathological worries.

This relative deficiency of long lines is due to the human brain being so large. As Wiener shows, the number of cells go up as the cube of the brain dimension while the connectors go up only as the square. Consequently, the larger the brain the greater the traffic density. Hence when overload occurs the processes involving the remote parts of the brain are the first to be affected. This is a well known fact.

This shortage of long lines furnishes a very reasonable explanation of the speech disturbances that frequently occur when a left-handed child is forcibly trained to become right-handed. In a left-handed person the right brain-lobe is dominant, and hence it is the location of

the higher processes. When he uses his right hand the left lobe is activated. Hence messages must cross repeatedly from one lobe to the other. But this is precisely the region where there are the fewest connectors. Hence there is a traffic jam and stuttering results. Science fiction writers designing mutants should take a hint and make their creatures have more connectors rather than larger brains. Apparently it is already too large for efficiency.

An interesting example of an accidental upset of the stability of a feedback loop occurs in the condition known as *causalgia*, meaning burning pain. It was first observed during the Civil War. Soldiers who received apparently trivial bullet wounds would complain of pain so excruciating that even a breath of air across the injured member was intolerable. The explanation was found only recently. Apparently the injury is to a nerve ending. The irritated nerve sends out a pulse which returns by complicated feedback paths unimpaired in strength and triggers off a new pulse. As time goes on, more and more paths are included. If it goes on too long, not even a nerve operation will help. In some cases a cure was effected by injecting novocaine into the main feedback path. This prevented the neurons from repeating the incoming pulses and hence acted by opening up the feedback path. Even after

the narcotic wore off, the trouble did not recur for exactly the same reason that a machine whose normal stability is upset may be restored to order by stopping it for a while.

A closely allied case is the one where people who have lost a limb complain of pain in the missing member. There is a case on record where a man who lost his arm was troubled by not being able to unclench the fist on the lost arm! This was not a hallucination, merely the consequence of the injured nerve endings sending stimuli to that part of the visual cortex that happened to coincide with this pattern. When novocaine was injected he remarked that he could see his fingers slowly unfolding.

Cybernetics has thrown a good deal of light on the psychology of perception—Gestalt psychology. It has gone quite a way in answering the question: why we are able to recognize familiar things and to pick out similarities. Closely allied to this field is the possibility of aids to injured or lost senses, such as devices for translating sight into sound and vice versa. Unfortunately, we lack the space to go into this phase of the subject.

Another interesting subject is the view of society from the cybernetic standpoint. Wiener points out the lack of homeostatic or regulatory processes in society. He gives reasons why the chances of repairing this lack is not good. If you happen

to be strongly conservative in your politics, you may disagree violently with certain of his views. However that may be, you will still find them interesting.

Of course, there are those among Wiener's followers who do not agree that the study of society is beyond the scope of cybernetic methods. A number of papers on this phase were presented at a two day meeting of the New York Academy of Sciences in October 1946. Unfortunately, these particular papers were never published. However, a good deal of the other material presented has been published. The interested reader will find it worthwhile to read Vol. 50, pages 187-278 of the Annals of the Academy.

A final word about the book. If you like to be stirred by bold new ideas, read it by all means. However, unless you are particularly well polished in advanced mathematics, skip the mathematics given. Despite Wiener's protestations, the mathematical arguments used are not necessary for an understanding of what he has to say. The ideas are so well expressed by his words that they refute his contention as to the necessity of the mathematics. As a final bit of criticism: If after you have read the book you wonder what the first three chapters have to do with the general theme, it may comfort you to know that you are not alone in this feeling.

THE END



THE QUEEN OF ZAMBA

BY L. SPRAGUE De CAMP

Conclusion. Hasselborg's problem, in getting the lady back home, was that a whole world of people got in the way—somewhat lethally in the way!—at every opportunity.

Illustrated by Rogers

Synopsis

Victor Hasselborg, an investigator of insurance frauds and a former operative of the Division of Investigation of the Ministry of Justice of the World Federation, now practicing privately in London, is hired by a Syrian textile magnate, Yussuf Batruni, to track down and, if possible,

bring back his daughter, Julnar Batruni, who has disappeared from London.

Hasselborg discovers that Julnar Batruni has eloped with Anthony Fallon, an adventurer and BBC radio announcer who left behind his lovely young wife, Alexandra Gashin Fallon, to run off to Pluto with this girl. In the course of his investiga-

tion Hasselborg becomes much drawn to Alexandra, but, being a man of some principle, he keeps his feelings to himself. He even offers to try to bring back Alexandra's errant spouse, though she is not sure she wants him back.

Bidding her good-by, Hasselborg takes a spaceship to Pluto, bringing with him a suitcase-full of the most advanced crime-detection apparatus. At Pluto he learns that the elopers have gone on to Krishna, a planet of one of the nearer stars whose dominant species is the most manlike of any known extraterrestrial life; except for green hair, antennaelike organs of smell, and pointed ears the Krishnas look superficially quite human. Hasselborg goes on to Krishna, knowing that at the speed at which he is traveling the Fitzgerald effect makes several years of objective time seem like a few weeks aboard the ship.

Arriving at Novorecife, the outpost on Krishna of the Viagens Interplanetarias, Hasselborg is astonished to learn of an Interplanetary Council ruling that forbids bringing mechanical devices and inventions into Krishna for fear of the use to which the warlike and premechanical Krishnans might put them. Hasselborg must, then, leave his pistol and other apparatus at Novorecife, disguise himself as a Krishnan, and pursue his quarry as best he can by primitive methods.

With Hasselborg has come the stocky, imperturbable Chuen Liao-dz, who claims to be an economic

official of the Chinese Government, but whom Hasselborg suspects of being a cop. At Novorecife Hasselborg is taken in hand by Julio Góis, the assistant security-officer, a Brazilian like most of the Viagens personnel, since Brazil is now the world's leading power and Brazilo-Portuguese is the language of the spaceways. Góis tells Hasselborg that Fallon and Julnar Batruni, who had come in on an earlier ship, took off for Rosid, the capital of the Dasht of Rúz, a feudal underling of the Dour—Emperor—of Gozashtand. After he has mastered the Gozashtandou language and learned to manage a sword and an aya-drawn buggy, Hasselborg sets out for Rosid, too. He takes with him a letter of introduction from Julio Góis to Djám bad-Koné, Dasht of Rúz, presenting Hasselborg as Kavir bad-Ma'lum, the distinguished artist.

Or so Góis said. Suspicious, Hasselborg opens the letter in his inn in Rosid, finding that actually Góis has inexplicably denounced him to the dasht as a spy from the neighboring republic of Mikardand. Hard pressed to know what to do, Hasselborg alters the letter to make it harmless, forges a new set of seals, and presents it to the dasht as originally planned. The dasht cordially welcomes Hasselborg to his court and invites him on a hunt the following day after a yeki, a large carnivore of the planet. Hasselborg goes, using his aya as a riding-animal, and after some misadventures helps to capture the beast. He learns that

the dasht plans to use the yeki in Roman-style public games with which the Rúzma celebrate astrological events.

Shortly after the hunt, the men of the dasht arrest Hasselborg for treason and throw him in jail. As he presently learns, the dasht has discovered his tampering with the letter of introduction. Hasselborg is condemned to be fed at the next celebration to the yeki he helped catch.

However, using the letter of credit which the rich Batruni sent him off with, Hasselborg bribes the jailer, Yeshram, to save him. First Yeshram has the yeki so overfed just before the game that it refuses to molest its intended prey in the arena. Then Yeshram stages a jail-delivery. Hasselborg is spirited out of the city at night and is given back his carriage and other possessions.

He drives hard all night and all the following day towards Hershid, the capital of Gozashtand. Perhaps there he can pick up some trace of Fallon and Miss Batruni; his inquiries so far have got him nowhere.

In the evening he stumbles onto a caravan which is being attacked by a band of mounted robbers. Since he still has a saddle among his gear, he impulsively unhitches his aya, saddles it, and gallops up to the caravan to rescue a beautiful girl whom he sees standing in the rearmost wagon. After some brisk fighting he flees with the robbers after him. By riding up into the wooded Kodum Hills he finally gives them the slip in the darkness.

He then discovers that the girl, whom he had seen at Djám's court, is Fouri bab-Vazid, the niece of Hasté bad-Labbadé. Hasté is the high priest of the state religion of Gozashtand, a kind of glorified astrology. Fouri was visiting a friend at Rosid until the unwelcome attentions of the dasht decided her to return home.

VIII.

An hour later he said: "I'm afraid we're lost good and proper."

"What do we then? Stay for the dawn?"

"We could, of course, though I don't like the idea with these high-jackers hanging around." After further thought he added: "All we need to make things perfect is to be treed by a yeki."

As if in answer, a low roar came across the mountains. Fouri threw her arms around his neck. "I fear!"

"There, there." He patted her back. "It's many hoda away." Although he could have stood in that agreeable position all night, they had more urgent things to think of. "If I could only find that long ridge again, we could walk right down the top of it—I know, you hold Avvaú." No more letting his mount run loose for him!

He took off his sword belt, found a tree with low branches, and climbed. While it was hard going, especially since the trunk was smooth and the branches widely spaced, he nevertheless managed to

raise himself eight or ten meters above the ground.

There were still only hills dotted with patches of woods and isolated trees, fitfully moonlit. Was that the missing spur? Couldn't be sure—

Then he snapped his attention to one thing—a little spark of light, far off, like a fifth-magnitude star. He strained his eyes, then remembered to look just to one side of it. Yes, there it was all right, twinkling like a star on a cold Earth night. That meant, probably, a fire. The robbers?

He studied as much as he could see of the terrain, noted the position of the moon, and descended. "If we go over that way, we may run into trouble. On the other hand if they're sitting around the fire they probably won't see us if we're careful, and we should be able to find our road at least."

"Whatever my hero says."

Hasselborg's eyebrows went up with a jerk. So, he was a hero now? He set out again briskly, stopping from time to time to verify his direction. At the end of an hour's walk he could see the spot of light from ground level.

"We'll have to be very quiet," he whispered. "At least I know where I am now. Come on."

He began a big circle to the left of the fire, spiraling gradually closer to it. After another quarter-hour he halted at the top of a steep slope.

"Here's the road," he said. "The thing seems to go right towards our friends."

The fire was now out of sight. As they skidded down the slope and started along the road, Hasselborg recognized the place as the slope up which he was walking the aya that afternoon when the idea of painting a sunset came to him. He dropped Fouri's hand and held his sword to keep it from clanking.

"Here's the buggy," he breathed.

He poked about it and found no sign of its having been tampered with. Up ahead, though the fire itself was invisible, he could see the light from it on trees over the crest of the rise.

"Hold the aya a minute," he said.

He left Fouri and walked slowly up the slope, crouching as he neared the top lest he blunder into the gang unawares. For the last few feet he lowered himself to hands and knees, then peered cautiously over.

Seven robbers stood or squatted about the fire, which had been built alongside the road. Two, crudely bandaged, sprawled in the dirt; the others ate in hasty gulps. Hasselborg could hear the snorts of their animals tethered nearby and the words:

"Why in the name of the stars didn't you—"

"Fool, how knew I you'd run off after—"

"You *seft!*! The caravan was no matter; we were being paid for the girl. All should have—"

"Where's Gherdavan?"

"A fine thing—four slain, two hurt,

one missing, and not a kard to show! The dasht can keep his gold for all—”

“Why slew you not the folk of the caravan? Then they'd not have taken courage and—”

“Ransoms, idiot—”

“. . . hasten, lest the soldiery find us—”

“. . . the dasht promised—”

“*Ghuvoi* the dasht! I think of the dour. 'Tis nigh his bourne—”

Hasselborg crept back and whispered: “If we hitch up quietly we can drive right through them. Are you game to try? I don't think they'll follow us very far into the dour's dominions.”

“Whatever you say.”

They unsaddled the aya, jumping fearfully at every click of a buckle. Then they put its harness back on it, moving snail-slowly to avoid noise.

“Now,” said Hasselborg when they had hitched Avvaú to the carriage, “can you drive?”

“Well enough.”

“All right, take the reins. To get speed up fast I'll have to run alongside and then swing aboard. When I say 'go', use the whip for all it's worth. Ready? Go!”

He reached in and snapped off the brake as the whip whistled and cracked. The carriage shuddered, the wheels crunched, and dirt flew from the six hoofs of the outraged animal. Hasselborg, walking alongside with one hand on the carriage-body, broke into a trot, then into a run, and then swung aboard.

“Give him the business!” he said.

Hanging onto the dashboard with his left hand, he drew his sword with his right and leaned out.

As they topped the rise into the firelight they picked up speed, until they were hurtling at the group of men by the fire.

The minute they appeared, some of the robbers looked around at the noise. These jumped to their feet and reached for weapons as the vehicle bore down upon them. One held up a hand like a traffic cop and shouted, then leaped for dear life. Another stepped forward with a sword. Hasselborg thrust at him. His stroke was parried with a clang, and then they were through and thundering into the dark.

“They don't seem to be coming after us,” said Hasselborg, leaning out of the buggy and looking to the rear. “I guess they were as badly scared as we were, and didn't know their chosen victim was in this rig.”

“What mean you, chosen victim?”

Hasselborg told her what he had overheard.

“That foul unha!” she cried. “Not satisfied with forcing me to flee his court, Djám hires cutthroats to kidnap me! I'll make him pay for this, the way Queen Nirizi made the jeweler pay for what he did.”

Although Hasselborg would like to have known what drastic fate Queen Nirizi inflicted upon the jeweler, he had other things to occupy him at the moment. They passed the place where the caravan had been attacked.

Aside from a brief glimpse of the ruins of the bishtar cart and a couple of unburied bodies, nothing remained.

Hasselborg said: "I think I see what happened. The bandits thought they had everything under control, and so they did until a couple of them tore away after that fellow who rode off on his aya, and some more came after us, which left only a couple guarding the prisoners. Seeing which, the prisoners grabbed up the weapons they'd just laid down and smote the robbers hip and thigh. When the other came back after hunting for us, the caravan was miles away, and they didn't dare follow it out of Djám's territory, since they'd bought their protection from him."

"Then my people may still live! We should catch them ere they reach Hershid, think you not?"

"Don't know; I'd have to scale it off on the map, and I don't know how accurate that is."

"Well then, will you take over the driving now?"

"In a minute." Hasselborg gave another look to the rear. The robbers' fire slid out of sight. A couple of miles more and he said: "Let's stop long enough to light the lanterns. This tearing around in the dark à la Ben Hur gives me the bleeps."

"Is that an expression in your native tongue? Surely my lord showed courage enough on that ride through the hills. I could have done nought without you, O man of might."

"Oh, I'm not as hot as all that," he

said, fumbling with the lanterns and glad that she could not see his look of embarrassment. "In fact the whole idea—" He was about to say that the whole idea of rescuing her had been a piece of irrational folly, which he'd never have undertaken if he had stopped to think, but judged such a remark tactless. "There, now at least we shan't miss a turn and smash up."

He took up the reins again. Since her costume was inadequate protection against the coolth of the long Krishnan night, he wrapped his cloak around both of them. She snuggled up to him, tickled his face with her antennae, and presently kissed the angle of his jaw.

So, sex was raising its beautiful head? How nice that the Krishnans had adopted this Earthly practice! And how nice that one could take one's eyes off the road and trust one's steed to find the way! *O quente cachorro!*

The sun was well up before Fouri awoke and stretched. "Where are we?" she asked.

"Somewhere on the road to Hershid."

"I know that, man of little wit! But where?"

"I can only guess that we'll arrive some time this afternoon."

"Well then, stop at the nearest farmhouse. I would eat."

This sharp, imperious tone was something new. He thought, some of the hero-worship must have al-

ready worn off, and gave her a silent, wooden look.

Thereupon she was all contrition: "Oh, did I wound my hero? I crawl! I abase myself! A foul-tempered and selfish witch am I!" She seized his hand and began kissing it. "You break my liver! Bear unkindness from you I cannot! Say I'm forgiven, or I throw myself from your carriage to my doom!"

"That's O.K., Lady Fouri," he said, wishing she wouldn't be so theatrical about it. Life was complicated enough without superfluous histrionics. He patted her and kissed her and cheered her up, while his mind ran far ahead, thinking of plans for his arrival in Hershid.

Presently she said: "We must be well into the dour's territory. Passed we not his bourne in the night?"

"You mean that place with a gate across the road and a sentry house? You were asleep."

"How about the sentries? Did they admit you?"

"Matter of fact they were asleep too, so I just got out and opened the gate myself. Seemed a shame to wake the poor guys."

They stopped at a hamlet for a meal, during which Hasselborg asked: "What's a good respectable inn in Hershid? I landed in some Thieves' Rest in Rosid and don't care to repeat the mistake."

"Oh, but Kavir, you shall stay at no inn! What think you of me? Chambers of the best in my uncle's palace shall be yours, where I can see you every day!"

Although the last item made it plain that more than simple gratitude was involved in this offer, Hasselborg suppressed a smile as he protested: "I couldn't accept such unearned hospitality! After all I'm a mere nobody, not even a knight, and your uncle doesn't know me from Ad . . . from Qarar."

"Who Ad may be I know not, but accept you he shall; he'd welcome his niece's rescuer in any event, and should he not I'd make him wish he'd never been hatched."

He didn't doubt that she could, too. "Well . . . if you insist—"

She did, of course, which fact pleased Hasselborg mightily, despite its threat of future complications, because it gave him a free and perhaps luxurious lodging right in the midst of things. While, despite his fear of germs, he could cheerfully put up with the worst in the way of accommodations when he had to, he still enjoyed the best when he could get it.

The rest of the journey proved uneventful. They failed to overhaul the caravan, which must have been making good time to get away from the perils of the Kodum Hills.

Hershid, as befitting the capital of an empire, was a larger and more splendid city than Rosid. As expected, they were halted at the gate. However, the guards recognized Fouri before she had said two words, jumped to present arms with their halberds, and waved the carriage through.

Fouri guided Hasselborg through the city until they stopped at the gates of a palace. The gates were adorned with geometrical gimmicks that Hasselborg recognized as Krishnan astrological symbols.

The inevitable gatekeeper stepped out, cried: "Mistress Fouri!" and ran across the court shouting. A whole swarm of people thereupon erupted out of the palace and crowded around the carriage, all trying to kiss Fouri's hands at once.

Then a tall Krishnan in a long blue robe appeared and the crowd opened to let him through. He and Fouri embraced. The latter said: "Uncle, this is my rescuer, the gallant Master Kavir—"

Hasselborg had his hand shaken—another borrowed Earth custom—and tried to follow the conversation with everybody talking at once: "What happened?" "Sandú, run to the barracks and tell the commander not to send out that squadron—" "Aye, the caravan arrived but a few minutes past with their tale of woe—" "Whatever befell your ladyship? You look as if you'd been trampled by wild ayas!"

An exaggeration, even though Fouri's flimsy costume did look beat-up as a result of her ride and hike through the Kodum Hills in the dark. As he was led to his room, it occurred to Hasselborg that if anyone needed valet service it was himself. He could see that his suit was torn and mud-splattered, and could feel the whiskers sprouting on his chin and the weal where a branch had

lashed him across the face on that wild ride into the hills. He'd have to shave soon or it would be obvious that his bristly beard was reddish-brown instead of Krishnan green, unless he emulated the gent who

"... was thinking of a plan
To dye one's whiskers green,
And always use so large a fan
That they could not be seen."

All that was taken care of by Hasté's household, which ran with un-Krishnan efficiency. An hour later he was shaved, bathed, perfumed—something he had to endure for the sake of sweet verisimilitude—and his clean suit had been laid out for him. After a short nap he dressed and went down to meet his host, whom he found awaiting him with what appeared to be a cocktail shaker.

Hasté bad-Labbadé was unusual among Krishnans in having lost most of his hair and all the color from the rest, which was silky white. His wrinkled parchmentlike features were also sharper than those of most of the race. In fact, had it not been for the organs of smell sprouting from between his brows he might have passed for an Earthman.

"My son," said Hasté, pouring, "there's little I can say to impress upon you my gratitude, save this: Feel free to call upon me at any time for aught I can do for you."

"Thank you, your reverence," said Hasselborg, warily eying his drink. However, so skillfully had it been mixed that the taste of alcohol could

hardly be detected, and he got it down without gagging. He reminded himself that as a habitual nondrinker he'd have to be careful and count his drinks, stretching them out as long as possible.

When Fouri joined them, Hasté said: "Tell me all about this extraordinary feat of rescue."

When they had told, Fouri asked her uncle: "Think you the dour will finally take action against Djám on your representation?"

Hasté smiled thinly. "I know not. You know how little weight I have with the dour these days."

"'Tis only because you lack courage to face down the old aqebat!" she snapped. "I could do better with him myself."

"Why, so you could, the reason being he likes you, looking upon you as a sort of daughter, while he holds me in despite."

"No matter of liking at all; but that he's a hard man and a clever one, who's gained his ends by struggle, and expects those about him to be equally hard and clever. Best him and he'll respect you; yield to him, as you're done, and he'll trample you into the mire. Would that I were a man!"

Hasselborg felt a suppressed tension between these two, too strong to be accounted for by a simple difference of opinion on how to manage the king. This might bear looking into. He said: "I . . . uh . . . perhaps you could explain this to me, your reverence? I've never been in

Hershid, and so don't know the local situation."

Hasté gave him a keen look. "My niece is no dissembler; were she on trial for her life she'd even so tell the judge what she thought of him, be it never so libelous."

"How about the differences between you and the dour?"

"'Tis a long tale, my son, going back many years and touching upon the very well-springs of men's actions. I know not how they think in your land, but here in Gozashtand men have been of several minds as to why events follow the course they do.

"The old belief had it, you see, that all was due to the will of the gods. However, with the growth of knowledge that belief seemed insufficient for divers causes, such as the question of why the gods seemed to make such a mess of human affairs, or why they should interest themselves in us mortals at all. In fact some blasphemers were heard to say that the gods existed not, though these were soon suppressed.

"Then about three hundred years past, our theologians proved to their satisfaction that the gods were neither a crew of lustful brawling barbarians reveling on the heights of Mount Méshaq, as thought our simple ancestors, nor yet a set of impalpable abstractions, the 'spirit of love' and the like, which none ever understood. Instead, they were in truth the luminaries of heaven: the sun, the moons, the planets, and the stars, which as they spun about our world sent down their occult influ-

ences singly and in combination and so controlled the fortunes of men. You'll recall 'twas about this time that the roundness of the world was discovered.

"So, thought we, we had at last the true scientific religion which should perform the proper offices of religion—to explain man and the universe, to predict the future, to comfort men in affliction, and to inculcate sound morals in the minds of the young. And so it seemed; the faith was made official in Gozashtand and its neighboring nations, and any deviation therefrom was condignly punished. Later, if you like, I'll show you one of the old cells in my own cellar, where heretics were kept for questioning. Now we can do nothing of the kind, though the dour betimes uses the accusation of heresy to dispose of politically inconvenient persons.

"Then what happened? The Ert-suma landed in their spaceships at the place that is now Novorecife, bringing news of other suns and other worlds revolving about them, for they told us for the first time that our world went around the sun and not vice versa. The planet Qond-yorr"—he meant Vishnu—"for instance, far from being the god of war, was but another world like our own, save warmer, with creatures on it not wholly unlike those of this world.

"So you see, good Master Kavir, the result has been a falling-away from the true faith. The Church may no longer punish her foes di-



FOUR I

rectly, but must sit in silence while a host of minor cults, even some brought in by the Ertsuma, spreads over the land like a murrain, sapping our spiritual strength and pre-empting our income. And as our power declines that of the dour waxes, wherefore relations are less cordial than once they were."

A little astonished by such frankness, Hasselborg asked: "Your reverence, what's your opinion about the gods, the planets, and so on?"

Hasté smiled faintly again. "As head of the Church, my official views are, of course, in accord with those adopted at the Council of Mishé forty-six years past. Privately, though I prefer that this be not repeated, I'm somewhat puzzled myself. Let's to dinner."

Fouri had put on another of her dazzling variety of personalities—grave and formal. She said: "Kavir's in Hershíd to get commissions for painting portraits. Could we not put him in the way of some business? 'Twere the least recompense for his heroism."

"To be sure we could. Let me think—I'd order one myself, had I not had one done within the year; I'll still do so if all else fails. As for the court, I know not quite how . . . my star is not in its dominant sector at the moment, but—"

"Oh, come, uncle! Why try you not the dour himself?"

"The dour, Fouri? But you know how blows the wind in that quarter—"

"Rouse yourself, you old man of

jelly!" she cried suddenly, the grave manner gone. "Always excuses. The privy council meets on the morrow, does it not?"

"To be sure, my child, but—"

"No buts! Take Master Kavir with you and present him to His Awesomeness as the world's greatest portraitist. Unless," she added ominously, "you prefer to try contentions with your loving niece?"

"Dear stars, no; I'll take him! Assuming he'll come, that is. You're for this scheme, my son?"

"Sure," said Hasselborg, adding a murmur of inexpressible thanks.

"I feared as much," said Hasté.

Later, over the cigars, Hasselborg brought up another matter: "Your reverence, I'm on the lookout for a certain young man who bought a portrait from me and then decamped without paying. He had a girl with him."

"Yes?"

"I wondered if there were any place in Hershíd where they'd know whether he passed through here?"

"Why, let me think—the dour has a good spy service, though I doubt they'd keep track of every traveler who passes this way, since Hershíd is after all the crossroad of the empire. What were these runaways like?"

"Like this," said Hasselborg, producing the sketches.

Hasté frowned at them, then began to laugh. "How much did he owe you?"

"Five hundred karda."

Hasté rang a bell, and when a silent young man in a plain blue priestly robe answered, he said: "Draw five hundred karda from my privy hoard and give them to Master Kavir."

"Stars preserve me!" said Hasselborg. "I didn't mean to collect it from your reverence—"

"All's well, my son, and count not the teeth of a gift shomal, as Qarar did in his dealings with the Witch of the Va'andao Sea. First, 'tis but a mean recompense for your rescue of my niece; and second, time which brings all things will bring me the chance to collect the debt from this your debtor."

"You know him?"

"But slightly."

"Who is he?"

"Can it be that you're yet so new to these parts? Why, unless I'm vastly mistaken, this is the true ten days' wonder, the paragon of the political virtues, the new Dour of Zamba, and the other's his douri."

"The King of Zamba?" said Hasselborg. "Since when? And what's Zamba?"

At this point the young priest glided back into the room with a heavy canvas sack which he set down with a clink beside Hasselborg.

Hasté said: "Fetch a map of Gozashtand and adjacent lands, Ghaddal. Master Kavir, for a traveled man, your knowledge is most... shall I say... spotty? Whence came you originally?"

"Malayer in the far South," said Hasselborg.

"That may be. Know, then, that Zamba is an island in the Sadabao Sea, lying just off the end of the Harquain peninsula, which forms the eastern extremity of Gozashtand. For years have the Zambava been plagued with seditions and uprisings, party against party and class against class. Finally the commons overthrew the aristocracy altogether and slew all those who did not escape. Thereupon, having no more common foe, the commons fell into factions with battles and murders, leader against leader.

"The upshot was that a few ten-nights ago your friend Antané... his name, is it not?... landed upon the isle with a gang of bullies whom he'd collected from the stars know whence, and in a few days had made himself master of all. Oh, 'twas neatly done, and he's gone on to effect many changes. For instance, you see, he's built a new aristocracy of leaders of the commons—those who came over to his side, that is—with all the titles and trappings of the old. However, the titles but cover the official posts of his little kingdom, are not hereditary, and are withdrawn the instant the incumbent fails to give satisfaction. No more young noblemen wallowing in the sin of idleness on Zamba!"

Maybe Fallon had been reading a life of Napoleon, thought Hasselborg, or maybe in that social situation things just broke that way. Al-

though he would have liked to hear more about King Anthony, Hasté seemed disinclined to discuss the subject further; the priest preferred to talk about large generalities like progress versus stability, or free-will versus predestination.

"For look you," he said, "there be those who pass rumors to the effect that King Antané's no true man at all, but an Ertsu in disguise. Not that it would matter greatly to me, since for years I've been telling my flock that 'tis wrong to judge people on a basis of their race rather than of their individual merits. I'm sure, however, that Antané's no Earthman, for they believe, most of them, in the curious doctrine of equality for all men, while our young paragon has set up no such system in his island kingdom. Now, you were among the Ertsuma during your stay at Novorecife, my son; enlighten an old man on these matters. What is this doctrine of equality, and do all Earthmen indeed adhere to it?"

"As a matter of fact," Hasselborg began, and would have launched into a brilliant ten-minute speech on the subject when it occurred to him that a Krishnan painter would hardly know that much about Earth's political theory. Was the old boy trying to trap him? He cautiously qualified his reply: "I don't know about these things from first-hand knowledge, your reverence; all I know is what I heard my Ertso friends saying in the course of conversation. As I get it, this theory is now the domi-

nant one among Earthmen, though it has not always been and may not always be. Moreover it doesn't mean literal equality of individuals, but a legal equality, or equality in matters of law—rights, obligations, and so on.

"They told me there were two great difficulties in building a political system on such a basis—first that people aren't biologically equal, but individuals differ widely in ability; second, that you have to have some sort of political organization to run the society except among the most primitive groups, and those in power have a natural tendency to try to alter the setup to make themselves legally superior to the governed. They all do it, whether they call themselves counts, capitalists, or commissars—"

As they fenced with ideas, Hasselborg thought that Hasté showed flashes of a rather surprising knowledge of Earth institutions.

Fouri maintained her gravity all evening, through supper, until they were saying good night. She gave Hasselborg her hand to kiss, glanced at Hasté's retreating back, leaned forward, and whispered: "Are you married, my hero?"

Hasselborg raised his eyebrows. "No."

"Excellent!" She gave him a swift kiss and went.

Oh-oh, thought Hasselborg, you don't need X-ray eyes to see what she's leading up to! Now that he knew where Fallon was, he'd better get away from Hershid quickly.

Could he sneak out that very night on the pretext that he liked to take buggy rides in the moonlight? No; in the first place that wouldn't get him to Zamba; the map showed the rocky Harquain peninsula as roadless. You had to take ship from Madjbur.

Moreover, did he want to go to Zamba so precipitately? If he simply walked in on Julnar to argue that she should return to her papa, Fallon might have him liquidated out of hand. Maybe he'd better hang around Hershid for a few days despite the matrimonial menace of the fair Fouri, and try to work out an angle.

Hasselborg was surprised when Hasté presented him to the dour; from Fouri's remarks he'd been led to expect something physically impressive, like the Dasht of Rúz. Instead, King Eqrar bad-Qavitar reminded Hasselborg of nothing so much as an Earth mouse.

"Yes, yes, yes," squeaked the mighty monarch quickly, offering his small hand to be kissed. "I've often thought of the same thing. A portrait. Hm-m-m. Hm-m-m. A fine idea. An excellent suggestion. Glad am I that you brought this wight around, Hasté. I'll wager that niece of yours put you up to it; she knows how to get around the old man, ha. Knew you as much, you'd be a power in the land. Master Kavir, how many sittings would you require?"

"Perhaps a dozen, your awesomeness."

"Right, right, right. We'll have the first this afternoon. An hour before dinner. West wing of the palace. The flunkies will pass you in and show you where. Bring all your gear. All of it. Nought vexes me more than an expert who comes to perform some office for one and then has to return home for more tools. Mind you, now."

"Yessir," said Hasselborg. Eqrar was evidently one of those who believed that "What I tell you three times is true."

"Good, good. And it is my command that you leave not the city of Hershid until the portrait be completed. A busy king am I, and I shall have to fit the sittings into my schedules as best I can. You have my leave to go."

Hasselborg, outwardly obsequious, swore under his breath. Now he was stuck in Hershid for the gods knew how long, especially if the dour was given to canceling appointments. While he might run away in defiance of the dour, he might also be caught and dragged back before he reached the border. At best he'd land in this nervous but powerful king's black book.

When he got back to Hasté's palace he asked Fouri: "How do you get to Madjbur?"

"Depart you so soon?" she cried, her voice rising in alarm.

"Not yet; the king says no. Still, I'd like to know."

"Then you might drive your car-

riage—there's a good road from the south gate—or you might take the railroad."

"Railroad?"

"Of course! Knew you not that Hershid's on the end of the line to Madjbur and on down the coast to Djazmurian?"

This I must see, thought Hasselborg, forbearing to ask more questions for fear of revealing ignorance. "Like a ride before lunch?"

She would, of course, and showed him the way to the terminal outside the wall on the south side of the city. The rails were about a meter apart, the cars little four-wheeled affairs with bodies like those of carriages, and the locomotives bishtars. A couple of the beasts were pushing and pulling cars around the yard under the guidance of mahouts who sat on their necks and blew little trumpets to warn of their approach. Fouri said:

"Alack, my hero, you're too late to see the daily train for Qadr pull out, and that from Qadr comes not in till around sunset."

"Where's Qadr?"

"A suburb of Madjbur, on this side of the Pichidé. No through train to Djazmurian, you see, because the river's too wide to be bridged; one must detrain at Qadr and cross the river by boat ere continuing on."

"Thanks."

After they had watched for a while she continued: "I can see we're truly soul mates, Kavir, for I, too, have always loved to hang

on the fence of the railroad yard and watch the trains made up."

Hasselborg shuddered a little mentally, as though he had cut himself on a dirty knife with no disinfectant available.

She went on: "If you're really set on going to Madjbur—I can wheedle aught I wish from the dour. Should I, for example, tell him that my affianced husband wished to travel, I know I could persuade him—"

Hasselborg changed the subject by asking about Zamba and its new ruler, though Fouri could add but little to what he already knew.

The king proved a difficult portrait subject, always fidgeting and scratching and wiping his pointed nose on his sleeve. To make matters worse, characters kept coming in to whisper in his ear or to present papers for him to sign. All this distraction reduced Hasselborg, who had little enough confidence in his ability as a painter, to a state bordering on frantic despair. He complained:

"If your awesomeness would only hold that pose for five minutes on end—"

"What mean you, painter?" yelped the king. "You scoundrel, you criticize me? I've held this pose without moving the breadth of a hair for the better part of an hour, and you dare say I've not? Get out! Why did I ever let you begin this thing? Begone! No, no, no, I meant it not. Come back and fall to work. Only let it be understood, no

more irreverent criticisms! I'm a very busy man, and if I work not on my royal business every minute, I never get it fulfilled. You're a good and faithful fellow. Fall to, waste no time, stand not gaping, get to work!"

Hasselborg sighed and stoically resumed his sketching. Then another man came in, this time omitting to whisper. The newcomer cried:

"May it please your awesomeness, the Dasht of Rúz has arrived unannounced, with fifty men-at-arms! He seeks an escaped prisoner who he thinks has fled to your court!"

IX.

After sitting with his mouth open for a few seconds, the king jumped up with a yell. "That blundering fool! 'Tis just like him to descend upon me without an hour's warning! No permission, no invitation, no request, no nought—*Ohé!*!" He looked keenly at Hasselborg, who had given up trying to make a sketch for the time being. "You, master painter, arrive one morning with a fine story of rescuing Hasté's niece from robbers in Djám's demesne. Then at the close of that selfsame day comes Djám himself hot on the trail of an alleged fugitive. A singular coincidence, would you not say?"

"Yes, your awesomeness."

"Well, show him in, show him in! We'll soon get to the bottom of this coil." The king paced up and down. "I doubt not that the rescue took place even as stated, for my men

questioned the survivors of that unlucky caravan at length. Still there's a mystery here; there's a mystery; there's a myst— Ah, my good vassal Djám!"

The Dasht of Rúz strode into the room, made the barest pretense of dropping to one knee in front of the king, and then went for Hasselborg with a roar, pulling at his sword. "You *seft!* I'll show you to bribe your way out of my jail!"

Hasselborg, who was getting a little tired of hairbreadth escapes, looked around frantically for a weapon, since he had been required to check his sword before being closeted with the king.

Eqrar, however, took care of that. Placing one of the big rings on his fingers in his mouth, he blew a high, piercing whistle. Instantly a pair of inconspicuous little doors in the wall flew open, and out of each sprang a couple of guards with cocked crossbows.

"Stand, or you're a dead vassal!" squeaked the king.

Djám sheathed his sword reluctantly. "Your awesomeness, my humble apologies for an irreverent intrusion. But by Qondyorr and Hoi, 'tis not to be borne that this heap of foulness who calls himself a painter shall be allowed to encumber the earth with his loathsome presence any longer!"

"What's he done?"

"I'll tell you straight. He comes to me, pretending to paint portraits, and is welcomed as an old friend. What happens? Within

the day I learn that he's no painter at all, but a spy from Mikardand sent to assassinate me. So, naturally, I fling him in pokey to be expended at the holy games. Then by some witchcraft he magicks the yeki so the beast won't eat him, and subsequently is spirited out of jail by a pair of fellow-desperadoes and disappears. Belike he corrupted someone in my service, or 'twould not have passed off so smoothly, though the villains all swear innocence and I can't hang 'em all in the hope of getting the right one."

"How know you he's a spy?" asked the king.

"My friend at Novorecife, Julio Góis, sent word. Here's his letter, see you, and here's another he sent with yon *baghan* who-altered it."

Hasselborg broke in: "May it please your awesomeness, I'm not a Mikardandu, as you'll find out if you inquire there. I only stopped a night at Mishé on my way to Novorecife, since Mikardand is no place for an artist. At Novorecife I made Góis' acquaintance and asked for an introduction to somebody in Rosid; that's all I know about it. The reason the dasht is so sore is that I busted up his attempt to have the Lady Fouri kidnaped by his gang of tame bandits."

"What's this? What's this?" said Eqrar.

"Sure, he did it. She told me herself she left Rosid because he wouldn't let her alone, so he had her snatched, and I don't think be-

cause he wanted a partner to play checkers with either."

"What about this, my lord Djám?" said the king.

"Lies, all lies," said the dasht. "Where's his proof?"

Hasselborg said: "I heard the robbers discussing the matter around their campfire. Bring some of them in and they'll tell you."

The king asked: "Where be these robbers now?"

"Hanged, every one of 'em," shouted Djám. "I chanced upon 'em whilst in pursuit of this wretch, and applied the high justice on the spot."

Hasselborg thought, I passed by his garden, and marked with one eye, how the Owl and the Panther were sharing a pie— "Because they'd failed to get her as he ordered, or else to shut their mouths for good."

The dasht started to bellow obscenities when the king said: "Peace, peace, peace, both of you. Now, here's a veritable puzzle. You, Djám, say that Master Kavir's a spy, though your only evidence is the word of the Ertsu Julio, which is inadmissible in Gozashtando law and worthless as a matter of general experience. Then you, sir painter, accuse my faithful vassal of suborning the abduction of the niece of the high priest of the Established Church for fell purposes—though the fellness of these purposes might be mitigated by the damsel's excessive beauty, which would rouse thoughts

of love in the liver of the holiest eremite. Still, the chick's a favorite of mine, since I have no girl-children of my own, and therefore I'd take a grave view of the matter were it substantially proved. Yet your only proof is the word of men whose word would carry little weight were they alive and none at all since they're deceased.

"I could, of course, have both of you interrogated with hot pincers"—he smiled unpleasantly, whereupon both Hasselborg and Djám looked gravely respectful—"save that in my experience that treatment, while oft beneficial to the victim as well as edifying to the spectator, fails to elicit that for which we're most eager—to wit, the truth. What would you with this man, Lord Djám?"

"I would snatch him back to Rúz, your awesomeness, to commute his sentence from death-by-beast to death-by-beheading, thereby showing my merciful nature, though I doubt he'll appreciate the change. If his magic'll glue him back together after his head's been separated from the rest of him, I'd say he'd earned his worthless life."

"But," cried the king, "how then shall my portrait be finished? From his sketch I can see that 'twill be the best ever made of me, which implies that, spy or no, he's a true artist even as he claims. No, no, no, Djám, you shall not take him away ere he's finished the great work; we owe that to the empire and to posterity!"

Djám chewed his lip, then said: "Could we not leave him here under guard long enough to complete the picture, and then slay him as he deserves?"

Hasselborg said: "Your supremacy, d'you really think a man with my artistic temperament could give his best to his art with a death sentence hanging over him?"

"No, no, I see your point, Master Kavir, and moreover there's the matter of your charge against Djám—"

"You're not crediting these fantastic lies?" said the dasht.

"You will kindly not interrupt your sovereign. 'Tis a serious matter, Master Kavir, to level such a charge against an anointed dash. But withal, your charge is as well-attested as his, which is to say not at all. Now, hear my judgment, both of you: You, Kavir bad-Ma'lum, shall remain inviolate at Hershid until the work be done. After that you may remain in this city, taking the hazard that Djám will return with evidence that would force me to give you to him; or you may leave, and in that case he may have you if he can catch you. You, Djám bad-Koné, abide by these conditions, and no sending of one of your ruffians to extinguish Master Kavir by stealth while he's in my territory. Should aught of that nature befall him, I'll know where to look. Seems that not fair?"

"Then," roared Djám, "there remains but one course. Kavir bad-

Matlum or whatever your name is, I declare you a knave, pervert, scoundrel, spy, coward, liar, and thief, and challenge you to disprove these assertions with weapons of war upon my person." With which the dasht pulled off his glove and threw it at Hasselborg.

The king sighed. "I thought I had everything arranged, and you do *that*. 'Tis true there's some question as to whether a person in Master Kavir's station be compelled to accept a challenge from a gentleman, especially one of your not inconsiderable rank—"

"See the case of Yezdan versus Qishtaspandú, only last year," retorted Djám. "A professional artist is considered constructively a gentleman, and so may be challenged."

"Here, here," said Hasselborg. "We do things a little differently in Malayer. Somebody explain. Djám wants to fight me, is that right?"

"And how I do!"

"What happens if I don't feel like fighting?"

"Ha hah!" said Djám. "A thin-livered wretch, said I not? Already he seeks to crawl out. Well sir, in that case we inflict upon you, as stigmata of your cowardice, the five mutilations, beginning with your ears—".

"Never mind the rest. Do I get a choice of weapons?"

"Surely. Any weapon in the approved list—lance, pike, sword, dagger, battle-ax, mace, halberd, gisarme, flail, javelin, longbow, crossbow, sling, or throwing-knife; with

or without shield, armored or bare, afoot or mounted. I'll take you on with any combination you care to mention, for you'll be the twelfth to try to stand against me. Twelve's my lucky number, you know."

Hasselborg, not thinking it necessary to ask what had become of the other eleven, got out his knuckleduster and showed it to the king. "Would this be allowed?"

"No, no, no!" said the latter. "What think you, that we're savages from the Kolof Swamps, to pummel each other with fists?"

"Then make it crossbows, unarmored, and afoot," said Hasselborg, who as an expert rifle-shot figured that this weapon would give him the best chance. "You'll have to give me a couple of days to practice up."

"Accepted," said Djám. "A fine brabble 'twill be, with me the best crossbow-hunter in Rúz. Saw you my collection of heads?"

"You mean the ones on spikes over the city gate? Vulgar ostentation, I thought."

"No, fool, the heads of the beasts I've slain. Your supremacy, let me urge that you set a guard over this scum, lest he steal away in the night."

"Fair enough," said the king. "Master Kavir, hear my royal command: That you move your gear forthwith to this the royal palace. I'll send men to help you move."

Hasselborg mentally added: To keep him from making a break for liberty.

Fouri's eyes widened with horror when he told her what was up, and Hasté seemed mildly distressed.

"A foolish business, dueling," said the priest. "The Council of Mishé condemned it in unequivocal terms. Though we of the cloth have long striven to convince the nobility of its sinful folly, they throw our own astrology back in our teeth, saying: won't the stars grant victory to him whose triumph is foreordained? Discouraging."

When he went to his room to pack, Fouri followed him, imperiously telling his pair of guards: "Stand you outside the door, churls! I command!"

Either the guards thought better of picking an argument with so domineering a young lady, or they knew her as a privileged character. She threw herself on Hasselborg's neck, crying: "My hero! My love! Can I do aught to save you?"

"Yes, as a matter of fact you can," he said. "Could you sew a pair of pads into the elbows of the jacket of my old suit?"

"Pads? Sew? What mean you?"

Hasselborg patiently turned the coat inside out and explained what he wanted.

"Oh, I understand now," she said. "A wretched seamstress I, but still I'll let none other do it, for then when you wear this jacket, the occult force of my love will flow through your veins and nerve you to deeds of might."

"That'll be nice," he said, folding his clothes on the bed.

"Oh, it will. And then at last shall I be avenged upon this filthy fellow." She stitched away clumsily for a while, then said: "Kavir, why hold you yourself aloof from me? You're colder than the great statue of Qarar in Mishé!"

"Really?"

"Yes, really. Have I not given you all the encouragement a decent maiden can, and more? Look you, Uncle Hasté could join us tonight in a few words, and the king wouldn't boggle at my accompanying you to your new chamber in his palace. Then whatever ensued, we'd have a sweet memory to carry with us to our graves, be they early or late."

Hasselborg began to worry lest he say "yes" against his better judgment simply to end the argument. When he looked at her it took all his will power not to take her up on her offer; he'd have done so had he been willing to discard his disguise. Of course there was Alexandra, but she was light-years away.

He pulled himself together. "I'm grateful for your regard, Fouri, but I don't anticipate an early grave; not this time anyway. Marriage is a serious matter, not to be entered into as a preliminary to a duel—"

"Then finish your sewing yourself, and I hope you prick your finger!" She threw the coat, needle and all, at his head, and stamped out, slamming the door.

Smiling wryly with a mixture of amusement, pity, and annoyance at the position in which circumstances had placed him, Victor Hasselborg



THEN THE ERTSUMA LANDED IN THEIR SPACE SHIPS

picked up the jacket, donned his glasses, and began complying with her order. Between Hasté's mercurial and amorous niece and the Lord of Rúz, he knew just how Odysseus felt in trying to steer between *Skylla* and *Charybdis*.

His move completed, Hasselborg spent a rather dismal evening. The guards whom the king had assigned to him had evidently received orders to stick like leeches. Although he would like to have mingled with the court and found out more about Zamba and its new rulers, the people proved unexpectedly impervious to the charm he turned on. He wondered if the presence of the guards at his elbow might not dampen con-

versation, until one of his victims set him right:

"Not that we esteem you not, Master Kavit, but that, should you succumb in the forthcoming contest, we'd have likely contracted some of your ill luck by fraternizing with a doomed man."

He retired morosely to his new room. Hasté and Fouri—who had become the courteous hostess again—kept him company for a while, the former seeming distressed in his long-winded and ineffectual way.

"Officially, you understand," said Hasté, "the Established Church discountenances magic. Still in such a case I might get in touch with one of the local witches, who'll put a spell on the dasht's bow—"

"Go right ahead," said Hasselborg.

"Not that I really believe in witchcraft," continued Hasté, "but one can't deny that strange things do happen, not to be explained by ordinary philosophy, as the prince says in Harian's play—"

Finally Hasté had to leave to check some astronomical observations, and took Fouri none too willingly along.

Left alone except for his ubiquitous guards, Hasselborg tried to read a Gozashtando book, but soon gave it up. The curlicues were just too hard to puzzle out, especially since he did not want to betray his ignorance of the written language in front of the guards by using his dictionary. Moreover the work itself seemed to be an interminable metrical romance, perhaps best comparable to the Earth epics of Ariosto and Vega Carpio.

He tried engaging the guards in conversation, finding them agreeable enough, but also that he had to do most of the talking. He dropped a few broad hints about his escape from the Rosid clink:

". . . you know, I've been lucky in making friends in fixes like that, and happily I've been able to pay them back handsomely. The friend who helped me in Rosid will never want for anything again—"

One of the guards said: "Very interesting, sir, but that could never happen here."

"No?"

"No. Our dour be a shrewd judge

of men, most careful to pick those for his personal guard who can't be bribed or corrupted."

He asked the other guard:

"Would you agree with that, chum?"

"Absolutely, sir."

Either he's equally honest, thought Hasselborg, or he's afraid to admit otherwise in front of his pal. If one could get him alone, then maybe—

But as time wore on, Hasselborg realized that he could not get either one of them alone, for they were under orders to watch each other as closely as they watched him.

Disgustedly he went to bed, revolving impractical schemes for talk-ing Fouri on a promise of marriage into ordering these guards to look the other way while he bolted. He was still thinking thus when he fell asleep.

The next morning Hasselborg went down to the royal armory to borrow a crossbow. He chose one that fitted his length of arm, and whose steel bow was as strong as he could cock with a quick heave of both hands on the string. Then he went out to the exercise ground, where he understood the duel would be held the following morning.

The minute he appeared, an official-looking person rushed up. "Master Kavir, you may not bring that weapon hither now!"

"Huh? Why not?" A crowd with their backs to Hasselborg was watching something. Being taller than most of them he soon made

out that they were looking at Djám bad-Koné at target practice.

"Why, the rule! Ever since Sir Gvastén 'accidentally' skewered the Pandr of Lúsh with a longbow shaft while they were at friendly practice for their duel, the dour has forbidden that two gentlemen under challenge should practice here at the same time."

"O.K., suppose you hold the bow until he's finished," said Hasselborg, handing over the weapon.

"Yes, yes, but I dare not let *you* promenade around here while *he's* armed; comprehend you not?"

"Oh, I'll be careful and not get close to him." Followed by his guards, Hasselborg strolled over to the crowd and watched quietly for some time before the other spectators became aware of his presence. Thereupon they turned heads to look at him, and the dasht, seeing him also, flashed him a rousing sneer over his shoulder and addressed himself again to the target.

The system appeared to be that the duelist had to stand with an uncocked crossbow in his hands and his back to the target. On a signal given by a whistle he snatched a bolt from his belt, cocked his weapon, whirled, and shot. The dasht's next bolt went through the man-shaped target in the heart region—that is, the Krishnan heart region, which was more centered than that of Earthmen—adding one more to a sinister constellation of holes in the cloth. Djám was obviously no tyro.

Hasselborg watched the dasht

closely for hints on how to beat this game. He remembered reading a case years before at Harvard Law School on the subject of obsolete laws—about the Englishman who around 1870, losing a lawsuit, challenged his opponent to trial by battle and appeared in the lists on the appointed day with lance and sword, armed capapie, and then claimed to have won his suit because the other litigant hadn't shown up. The lawyers scurried about frantically and found that the man *had* won his suit, and Disraeli had to call a special session of Parliament to abolish trial by battle.

After an hour or so the dasht quit and marched off, followed by the men-at-arms he had brought from Rosid. Several of the local gentry hung around, waiting to see Hasselborg perform.

Hasselborg, however, had no intention of making a fool of himself in front of company. He sat lazily on a bench and engaged his guards in conversation on the technical points of crossbowmanship, on the pretext that: "We do things differently in Malayer, but perhaps you local guys have better ideas—"

Since the incorruptible whom he had approached without success the previous night proved an enthusiast, Hasselborg had merely to feed him occasional questions until the spectators, becoming bored, drifted off.

"Now I'll try a few," said Hasselborg, to whom the marshal had given back his bow after Djám had de-

parted. "Remember that they use a different kind of bow in my country, so I'll make a few misses at first."

And a few clean misses he did make. The trouble with this thing was that it had no sights, but perhaps that could be remedied.

He asked: "Where can I get a couple of pins about so long, with round heads like so?" He indicated something on the order of a corsage pin.

"I can get you such," said the enthusiast, "for my sweetheart is maid to the Lady Mandai. Since I may not leave you, 'twill take some little time—"

Half an hour later Hasselborg had his pins. He firmly pressed one into the wooden stock of the crossbow near the muzzle end, to one side of the bolt groove, and the other into a corresponding position to the rear. Then he made a few more shots, adjusting the pins until, from the official distance, he could make a clean hit by shooting with the heads of the two pins in line with the target.

"By all the gods," said the enthusiast, "what's this our good Master Kavir has done? By the nose of Tyazan, 'tis surely a new and deadly idea!"

"Oh, that's old stuff where I come from," said Hasselborg.

He was now confident that he could hit the target all right; the problem remained to keep the target from hitting him. Djám had done all his shooting from an erect posi-

tion. "Do the rules require you to shoot standing?"

"What other position is there?" said the enthusiast.

The other guard said: "I've seen men shoot kneeling. In truth, the drillmaster the dour had before the present one taught sinking to one knee to shoot from behind a wall or other obstacle. That was before your time, Ardebil."

Hasselborg asked: "How about the rules?"

"I know of nought to prevent one from shooting from any position he likes," said the enthusiast. "For aught I know, 'tis legal to charge your foe and smite him on the pate with the stock of the bow."

Hasselborg cocked the bow and lay down prone, thankful for the pads in his jacket but also wishing the flagstones of the exercise court were cleaner. His shooting, however, became so good that the guards whistled their appreciation.

The enthusiast said: "'Twere a chivalrous thing to warn the dasht of that which he faces."

"You wouldn't want to spoil his surprise, would you?" said Hasselborg.

Next morning Hasselborg stood on the same flagstones listening to the marshal intone the rules of the contest: ". . . and at the ends of the court your bows will be handed unto you. You shall stand facing the wall and making no move until the whistle. Then may you fight how-

soever you will, and may the stars grant victory to the right."

The marshal was standing in back of a little wooden wall about a meter long and breast-high, behind which he could duck if things got too hot. He and the duelists were the only people in the court, though the palace windows which surrounded the court on three sides were full of faces. King Eqrar, High Priest Hasté, Fouri—

"Stand back to back," said the marshal. "Now walk to the ends of the court: one—two—one—two—"

"Are you ready?"

Hasselborg stood facing the stone wall, gooseflesh on his back, into which back he more than half expected Djám to send an iron bolt any second. He was finding a formal duel harder on his nerve than he expected. A fight was one thing; he'd been in several on Earth that had resulted fatally for his antagonist. The first time it had given him the bleeps, but after that he'd taken it as a matter of course. Now the shivery feeling of his first lethal fight had come back. This standing up like a fool and deliberately risking—

The whistle blew piercingly. Hasselborg, tensed for action, dropped the nose of his crossbow to the ground, stuck his toe into the stirrup on the end, and heaved on the string. It came back with a faint sound into the notch. He snatched a bolt from his belt, whirled, and threw himself prone on his elbow

pads, placed the bolt in its groove, and sighted on his target.

Djám bad-Koné was just sighting along his cocked crossbow as Hasselborg brought the heads of the pins into line with the shiniest of the medals on the chest of the dasht. Djám seemed to hesitate; raised his head for a second to look at the antagonist who had fallen down without waiting to be hit, then squinted down the stock of his weapon again.

Hasselborg squeezed the trigger. The stock kicked sharply and the bolt flashed away with a hum, rising and falling a few centimeters in its flat trajectory.

Then something exploded in Hasselborg's head, and the light went out.

X.

Feeling hands trying to turn him over, Victor Hasselborg opened his eyes. His head ached frightfully.

"He lives yet," said one.

"Which can't be said for the other," said somebody else. Their general chatter made a dull roar in Hasselborg's head.

With great effort he pulled himself into a sitting position and felt of his pate. At least there did not seem to be any fragments of skull grinding together like ice-floes in an Arctic storm, though his hand came away bloody. The dasht's bolt must have grazed his scalp and carried away his hat, which lay on the stones between him and the wall.

"I'm O.K.," he said. "Just let

me alone a minute." He wanted no Krishnan fingers exploring around the roots of his dyed hair or his glued-on antennae.

"Look!" said a voice, "a new method of sighting a bow, by the stars! Had we such at the battle of Meozid—"

". . . by Qondyorr, not knightly; he should have warned Djám, so that—"

". . . has the new dasht reached his majority?"

Hasselborg realized that the king was looking down at him. He got up, staggered a little, and finally found his balance.

"Yes, sire?" he said.

The king replied: "Master painter you've riven me of a good vassal, a good stout fellow. Though since it had to be one or the other of you I'm not altogether displeased 'twas he. While a strong and loyal right arm, there's no denying he was difficult. Yes, difficult. Kidnapping gentlewomen— Get you to the surgeon and have your crown patched, and then let's to the painting again. It had better be good, now. I suppose I shall have to attend his funeral; barbaric things, funerals."

"I thank your awesomeness, but with my head feeling the way it does I'm afraid the picture would look pretty gruesome. Can't we put off the next sitting for a day at least?"

"No, varlet! When I say I wish it today—but then, perhaps you're right. I shouldn't wish my nose in the picture to wander over my face like the Pichidé River over the

Gozashtando Plain merely because my artists can't see straight. Get you patched and rested, and resume your work as soon as may be thereafter. Stray you not from the city, however."

"I don't suppose I need these guards any more, do I?"

"No, no, they're dismissed."

"And d'you mind if—"

"If what? If what?"

"Nothing, your supremacy. You've done me enough favors already."

He managed a teetary bow, and the king minced off. Hasselborg had been about to ask to be allowed to move back to Hasté's palace, where the service was better organized, when it occurred to him that he'd be encouraging Fouri to think up some scheme to lure or coerce him into marrying her.

Fouri was gushing over his survival and Hasté was congratulating him in more restrained style when a rough-looking individual said: "Master Kavir, may I have a word? I'm Ferzaö bad-Qé, captain of the late dasht's personal guard."

When he got Hasselborg aside, the man continued: "Now that the death of the dasht has canceled our oaths to him, the lads and I wonder what next, d'ye see? The late dasht was a good fellow, albeit careless with his coin, so that our pay came somewhat irregularly. Now he's gone, his eldest inherits, but is not yet of age, wherefore his widow's regent. A sour wench, as thrifty as the dasht was liberal, and will no

doubt start by letting half of us go and cutting the pay of the rest.

"So we wondered if in accordance with the old custom ye'd like to take us on as your men. We're stout fighters, none fiercer, and if ye but give us the word we'll seize an isle in the Sadabao Sea and make ye a sea king, like that fellow on Zamba. What say ye?"

This was a new problem. "How much did the dasht pay you?" asked Hasselborg.

"Oh, as to that; the amount varied with rank, length of service, and the like. The total came to mayhap forty karda a ten-night."

Not bad for an armed gang, thought Hasselborg, though no doubt he'd find he'd let himself in for a lot of extras as well. Maybe these birds would come in handy, and the money Hasté had given him would pay them for some time even without his sending to Novorecife.

"I'll do it," he said.

As things turned out, not all of Djám's men wanted service under Hasselborg. Only twenty-nine of them when all were counted. Some of the others said they might consider it after they'd returned to Rosid for their former master's funeral. *Tant mieux*; the money would last even longer.

Hasselborg shut himself up in his room, applied his pills to his headache, and tried to examine his wound. Unfortunately the latter was on the extreme top of his head where he could not see it with a sin-

gle mirror. After half an hour's experimenting he rigged up a second mirror so that he could look down on himself.

The gash had stopped bleeding, and the hair around it was thick with dried blood. He washed some of the blood out, cut off some of the hair next to the scalp with the little scissors from his sewing kit, applied disinfectant, and closed the wound with a small piece of adhesive tape. Not a professional job, but it would have to do.

In the process he noticed that his hair was beginning to show brown at the roots. Therefore, with a small brush, he applied the dye that the barber at Novorecife had sold him, around the edges where it showed. The antennae seemed still secure; however, one of the pointed tips of his ears was coming adrift and had to be re-glued.

He spent most of the day napping. Then he set out for dinner at Hasté's palace, having promised the high priest with some misgivings that he would eat with them that night to celebrate his survival. This time, however, he had a legitimate excuse to turn down Hasté's cocktails, saying his head ached still; he'd noticed with alarm that he was actually getting to like these drinks.

"Tell me about Zamba and its new dour," he asked Hasté.

The priest raised his antennae. "Why are you interested, my son? I should think that having received your fee for Antané's portrait, your curiosity would be satisfied."

"Oh, well— I just wondered how Antané got so far in such a short time. He never impressed me that much when I knew him. And what's he going to do next, now that he has his kingdom?"

"As to that, that's as the stars— yes?"

A younger priest, the one Hasselborg had seen on previous occasions, had just come in to whisper in Hasté's ear. The high priest said: "'Tis as bad as being a physician. I must go to check the heliacal setting of Rrayord. Tell the cook to hold dinner a few moments, will you, Fouri?"

When her uncle had gone, Fouri leaned towards Hasselborg and looked at him out of her fathomless green slanting eyes. "I could tell you news of Zamba. My gossips at the dour's palace fill my ears with it."

"What is it?"

She smiled. "I but said I could tell, not that I would."

"What d'you mean?" Of course he knew well enough. O boy, here we go again!

"I could be valuable helpmeet to one like yourself, but see no point in throwing away my favor to one who'll merely say 'thank you' and ride off and think no more of Fouri."

"How do I know your gossip's as valuable as all that?" he said.

"Trust my word. I have news of import about King Antané."

Hasselborg shook his head. "I'm afraid I can't make a trade for any secret sight unseen." Seeing her

look of pain, he added: "Of course I am fond of you in a way, and if your news were important it might help me to make up my mind about other things."

"*Chá!* Let's not spar with wooden swords any longer. Will you promise, if it does in truth prove important, to wed me instanter, by the rites of the Established Church?"

"No."

"Oh, you wretched man! So I'm to give you all I know and mayhap you'll consider what to do next, as if that were a great kindness! Am I so ugly? Am I so cold?"

"No."

"What then?"

"Matter of principle."

"Principle! Curse your principles!" She strode up and down in agitation, storming: "I should hire a bravo to put steel through your gullet, to see if you'd bleed or merely run ink from the wound! Never have I known such a man! One would think you—"

Hasselborg found himself disliking this scene more and more. He fought down a temptation either to break off their equivocal relationship finally, or else to accept her offer.

"Well?" she said.

"What I've told you. I'd love to hear your news, and the more you help me the more grateful I'll be. But I absolutely won't promise to marry you. Not at this stage, anyway."

She stood breathing hard. "Look

you. I'll tell you what I hear. Then do as you like—go where you will, cast me aside, revile and beat me if you will. I'll ask nought of you, save that you believe that I truly love you and wish you well."

"O.K., I'll believe that. And I won't say I mightn't feel the same—some day. But what's the news?"

"This—King Antané and his queen sail from Zamba for Madjbur any day."

Hasselborg sat up sharply. "What for?"

"That I know not, nor my informant. Antané comes betimes to Madjbur to buy, both for himself and for his kingdom, or to talk trade with the syndics of the Free City. For aught I know his present visit's of that kind. But see you not the true weight of what I've told you?"

"How?"

"Why, if you'd accost this sea king with whatever mysterious business you have with him, and him unwilling, you'd have to pick a time when he's ashore. On his island you could never draw nigh without his leave, for his galleys command the seas thereabouts. Now see you?"

"I do, and thanks a lot. The next problem is, how am I to get away from Hershid without having King Eqrar get sore and send his army after me?"

Fouri thought an instant and said: "Perhaps I could persuade him. The old *baghan* likes me well, though he cares not overmuch for my uncle. I know not if he'd listen or no. Could

I prevail upon him, would you change your mind?"

Hasselborg grinned. "No, darling. You're a most persistent young person, aren't you?"

"No joking matter! See you not that you're tearing my liver in shreds? Oh, Kavir, I always dreamed of a man like you—" And she began to weep.

Hasselborg comforted her as best he could, then said: "Pull yourself together. I think I hear your uncle coming back."

In an instant she was the solemnly courteous hostess again. Hasselborg thought, whatever Krishnan finally joins his lot with hers will certainly never have a dull moment.

Next morning Hasselborg went to the king saying: "May it please your awesomeness, my headache's gone—"

"So? Good! Excellent! Then we'll resume the sittings at once. I have an hour this afternoon—"

"Just a minute, sire! I was about to say that, while my headache's gone, I find that my artistic temperament has been so shaken by this duel that I couldn't possibly do good work until my nerves quiet down."

"And when will that be?"

"I don't know for sure; it was my first duel, you know."

"Forsooth? You handled yourself well."

"Thanks. But as I was saying, I'd guess I'll be ready to paint again in less than a ten-night."

"Hm-m-m. Well, well, if that's

the way of it, I suppose I shall have to let you hang around ogling the ladies until you make up your mind, or whatever an artist has in lieu of a mind. Most unsatisfactory people, artists. Most unsatisfactory. Can't depend on them. You're like old Hasté, always promising but never delivering."

"I'm sorry if I make your awesomeness impatient, but we're dealing with one of those divine gifts that can't be forced. Anyway, aren't you leaving soon for Djám's funeral?"

"That is true; I shall be out of Hershid for some days."

"All right then. In the meantime I'd like permission to take a little vacation away from Hershid, too."

"Where away from Hershid?" said Eqrar with a suspicious look.

"Well—I was thinking of running down to Madjbur for a day or two. Change of scene, you know."

"No, I know not! You painters are really intolerable! Here I give you a good fat commission, and anybody would agree that a good subject am I, and the prestige of having painted me alone would be worth your time. I don't even bring a charge of homicide against you when you slay one of my retainers in a fight. And what do you? Excuses, procrastinations, evasion! I'll not have it! Sirrah, consider yourself . . . no, wait. Why come you not to Rosid with me? We might get some painting done on the route."

THE KING'S PORTRAIT



"Oh, sire! In the first place Djám's funeral would shatter my nerves utterly; and in the second I hardly think his people would consider me a welcome guest."

"True, true. Well, if I let you go to Madjbur, how know I 'tis not an excuse to get out of my jurisdiction and flee, leaving me with nought but a charcoal sketch for my trouble?"

"That's easy, sir. I'm leaving a good-sized sum of money here, and also that gang of Djám's men who signed up to work for me. There's also the little matter of my bill for this painting I'm working on now. You don't think I'd abandon valubel assets like that, do you?"

"I suppose not. Go on your silly trip, then, and may the gods help you if you come not back as promised!"

"Could you give me an introduction to somebody there? Your ambassador, say?"

"I have a resident commissioner in the Free City. Naén, write this worthless artist a note to Gorbovast, will you? I'll sign it here and now."

This time Hasselborg took pains to stand in front of the secretary's desk as the latter wrote, and to try to read the letter upside down. If written Gozashtandou was hard to read right side up, it was worse inverted. Still, the message seemed straightforward enough, with no deadly words like "spy".

The Krishnan noon therefore found Victor Hasselborg trotting his buggy briskly down the road to-

wards the Free City of Madjbur. He hadn't even said good-by to Fouri; had sent one of his men to Hasté's palace with a message instead, not wanting another scene or demand that he take her along.

He had also been strongly tempted to take one of these burly ruffians with him, but had given up the idea. Traveling with a Krishnan would almost certainly result in his learning that Hasselborg was an Earthman.

He passed the usual road traffic; overtook and passed the daily train from Hershid to Qadr. It comprised five little cars, three passenger and two freight, pulled along by a bishtar shuffling between the rails. A couple of young Krishnans in one of the passenger cars waved at him, just as children did on Earth. He waved back, feeling, for the first time since his arrival, homesick. Dearest Alexandra— He got out her handkerchief for a quick look at it.

He arrived at the village of Qadr the evening of his second day on the road. As the last ferryboat for Madjbur had already left, he spent the night without incident in Qadr, and took the first boat across next morning. It was a big barge, rowed by a dozen oarsmen manning long sweeps, and helped along by two triangular lateen sails bellying in the westerly breeze that came down the river on their starboard beam. To port the low shores of the mouth of the Pichidé fell away to nothing,

leaving the Sadabao Sea sparkling in the rising sun.

A war galley with catapults in its bows went past, oars thumping in their oarlocks, and off to port a fat merchantman was trying to beat into the harbor against the wind. The latter was having a hard time because at the end of reach the ship wore round like a square-rigger instead of tacking, meanwhile dipping the high ends of the lateen yards and raising the low ends to reverse the set of the yellow sails. During this complicated process the ship lost almost as much distance drifting down-wind as she had previously gained by running close-hauled. Hasselborg thought: Why doesn't one of our people show them how to rig a proper fore-and-aft sail . . ? and then remembered the Interplanetary Council rule.

A Krishnan objected loudly when Hasselborg's aya snaffled one of the fruits he was bringing into Madjbur. Hasselborg had to buy a whole basketful to pacify the man.

Gorbovast, the resident commissioner, was helpful in such essentials as recommending places for Hasselborg to stay and to amuse himself. While the commissioner did not actually say so, Hasselborg got the impression that some of the amusements of this famous seaport were distinctly on the rugged side, like those of Shanghai and Marseilles on Earth.

And, unfortunately, Hasselborg could not very well ask the fellow outright about the expected visit

of the King of Zamba, as he was no longer supposed to be interested in such matters, and the commissioner would report any unseemly curiosity back to his boss.

Since the Krishnans, unlike most intelligent extraterrestrials, had a highly developed system of public eating and drinking houses, there was nothing for it but to brace himself for the ordeal of a waterfront pub-crawl. He'd done it before—you go into the first grog-shop, order one, strike up a conversation with the first fellow-customer who looks as if he had one brain cell to rub against another, and get him talking. If he proves an empty sack you go on to the next. Hasselborg had nearly always, at least in the smaller cities, been able to get a line on what he wanted to know by this method, though it sometimes took days and was hard on his delicately conditioned stomach. Furthermore it always filled him with morbid fears of picking up an infection.

Thus evening found him halfway down Madjbur's waterfront, feeling poorly both in the head and in the digestive system, about to pump his twenty-second sucker. Some of the tougher characters had looked at him speculatively, but so far the combination of his powerful build and conspicuous sword had discouraged hostilities.

His present victim, a sailor from the far island of Sotaspé with the quaint name of Morbid, bid fair to prove an empty sack. The man was

one who could take but little liquor, and he had already had that and wanted to sing the songs of his childhood. He sang in a dialect that Hasselborg could follow only half the time, and remembered these songs in quantity and detail that would have done credit to a psychoanalytical treatment. Hasselborg began to cast about for means of escape.

The other end of the bench held another pair in close converse. One, facing Hasselborg, was a rustic-looking character talking slowly and with great emphasis to a bulky fellow with his back to Hasselborg.

The bulky fellow looked around to see what had become of the servitor, and Hasselborg spilled a drop of his kvad with surprise. It was Chuen Liao-dz.

XI.

"Excuse me, chum," said Hasselborg to his companion. "I see an old friend."

He walked down the length of the bench and placed a hand gently on Chuen's shoulder, saying: "*Ni hau bu hau?*"

Chuen turned his head with a slight smile and no sign of surprise. "*Wo hau,*" he replied in Chinese, then switched back to Gozashtandou: "Fancy meeting you here! Sanándadj, this is my old friend . . . ah . . . my old friend—"

"Kavir bad-Ma'lum," said Hasselborg.

"Of course. Sanándadj has been

telling me about almanacs. Most fascinating business." He tipped a wink at Hasselborg. "I wondered how long it would take you to notice me. How about your friend, the sailor?"

"He sings."

"Indeed? Then we must introduce them. Master Sanándadj can tell the mariner about almanacs while latter sings. Most, jolly arrangement."

"O.K. Ahoy there, Morbid!" Hasselborg dragged the more or less unwilling sailor down and set him to singing to Chuen's friend, who kept right on talking almanacs, trying to shout down his new acquaintance. Under cover of the resulting racket Hasselborg asked Chuen: "What name are you going by?"

"Liyao, which is the nearest they can come to first part of my name. The surname they cannot manage at all; it comes out Chuvon or something like that. I was amazed to learn that we Chinese are not only almost the only people on Earth to follow the simple rational system of putting surname first, but almost only people in the galaxy as well. Now, tell me of your adventures."

"Not just yet. Suppose you tell me yours. This is a funny way to investigate economic conditions with a view to arranging high-grade imports and exports, isn't it?"

"A little unusual, perhaps."

"Chum, you're no more an economic official than I am; you're a cop."

Chuen smiled. "*Shü bu shü?*"

"*Perfeitamente.* Now, I think we can do each other more good by working together than separately."

"So? What do you propose?"

"A general laying of cards on the table. Do you follow me?"

"Very interesting idea."

"Oh, I know, you're wondering how you can be sure I'm honest, and how can I be sure you are, and so on. Do you know my mission?"

"No. You never told me."

"Well then, I'll tell you, and you can decide whether it's worth your while to be equally frank. I don't think you'll have any motive for putting a spoke in my wheel, and I trust I'll feel the same way about you." Hasselborg went on to tell of the pursuit of the truant Julnar Batruni.

Chuen looked really surprised when he had finished, saying: "You mean this man sends you off on this great expensive dangerous trip merely for petty personal motives?"

"If you call wanting to get his daughter back a petty personal motive, yes."

"But . . . but that is sheer romanticism! And I thought all the time you were involved in some profound matter of interplanetary intrigue; something to do with government policies and interstellar relations! Now turns out nothing but pursuit of runaway young woman!" He shook his head. "I think you have converted me to socialism, Master Kavir."

"O.K., but how about your opening up with me? I may need help

on my project and I can't hire a local yokel for reasons you can guess. Maybe you're in the same fix. How about it, huh?"

Chuen thought a while, then said: "I . . . ah . . . I think maybe you have reason, so here goes. I'm an agent for Chinese government with special commission from World Federation. I started out to try trace a shipment of fifty machine guns consigned from factory in Detroit to my government for their security police. These guns start out all right but don't arrive.

"Now, economically speaking fifty machine guns is nothing at all to big government, but still nobody likes to have stolen guns floating around in hands of the criminal class. So, they put Chuen on job. Trail leads first to gangsters in Tientsin, who keep only twenty-six of guns and pass the other twenty-four on to an official of *Viagens Interplanetarias*.

"Things are obviously getting beyond national scope, so my government gets me a special commission from W. F. to run down missing guns. I find they've been brought to Krishna, to be smuggled out of Novorecife for delivery to some local potentate. The local potentate will use them to conquer the planet, or at least as much of it as can manage."

"Who was to do the smuggling out of Novorecife?" asked Hasselborg.

"Don't know. Somebody on the inside, no doubt."

Hasselborg nodded. "But who

gets the guns? Don't tell me, let me guess. Anthony Fallon, right?"

"Right again."

Hasselborg lit a cigar. "Have one? No wonder I ran into you here. It seemed too good for a coincidence, but with you on the track of Tony's guns, and me after his girl, our paths were bound to cross. Where are the guns now?"

Chuen shrugged. "Wish I knew. I heard a story that a mysterious crate has been hidden in the Kolof Swamp by one of gangs of robbers that live there, but was no way for me to find them. Swamp not only big, but full of unpleasant monsters, too. However, since I felt sure they'd been delivered to Madjbur for Fallon to pick them up, I came here to try intercept them. Been here days, checking boats and rafts that come down the river and trying to pick up a lead in bars and restaurants."

Hasselborg said: "I may be able to help you there," and told the rumor of Fallon's impending arrival in Madjbur. "I imagine whoever's in charge of the guns will arrange to have them here when Fallon arrives."

"I imagine, too. What connections you got in Madjbur?"

"King Eqrar gave me a letter to his envoy Gorbovast."

"Good. Can you ask Gorbovast when Fallon is expected?"

"Not very well; I'm supposed to be here on a short vacation and not to be interested in Fallon, and I suppose old Eqrar will check up on me

through Gorbovast. Could you?"

"Maybe. I am friend of Chief Syndic, who know Gorbovast; maybe the syndic knows. We see."

The following afternoon Chuen came upon Hasselborg sitting on the top of a pile on the biggest pier and giving a convincing imitation of a congenital loafer. Chuen said:

"The syndic say Fallon due to arrive tomorrow night or early next day. Guns *must* arrive soon. Are you sure nothing's come in this morning?"

"Not a thing except a towboat with two passengers and no freight at all, and a timber raft from way up-river with nothing on it except a stove and a tent for the raftmen. *Tamates*, haven't we forgotten about Qadr? Any piers over there?"

"Yes, but they're only used for fishing boats and such. All big commercial traffic uses this side."

"Well, mightn't our mysterious friends be landing in Qadr for just that reason?"

"Maybe, now that you mention it. What shall we do about it?"

"Suppose you take over here, and I'll go across the river and look around."

"All right."

It transpired that the ferry was across the river and would not return for another hour. Hasselborg killed time by strolling about the piers and through nearby streets to orient himself, and by pumping another sucker in a bar. Another empty sack. Fortunately impatience

was not prominent among Hasselborg's vices.

When he returned to the ferry pier, it was to find a crowd watching the efforts of a crew in the uniform of railroad employees trying to keep a bishtar calm. The ferry was unloading. The spectators watched with a mixture of curiosity and apprehension, holding themselves poised for flight in case the huge animal got out of control.

When the last wagon rumbled off and the sails had been furled and reset, the ferry master signaled to board the boat. Some of those who had been intending to do so, seeing that they were to share the craft with the bishtar, changed their minds. Others got on, but huddled in the corners of the vessel, leaving as large a clear space as possible for the monster.

The bishtar, under the urging of its keepers, put out a foot and gingerly tried the deck of the ferry. Apparently not liking the yielding sensation, it shied back. The man yelled and whacked it with sticks and pulled on goads which they hooked into its thick hide. The bishtar squealed angrily and rolled ugly little eyes this way and that, but finally let itself be driven aboard, one foot after another. The ferry settled visibly as it took the weight.

Then the sailors cast off the lines and pushed off with poles. The oarsmen ran out their sweeps and set to their task, backing out from the pier and turning the scowl-like vessel towards Qadr, and grunting

with every heave. As they came about, the sailors shook out the sails, whose flapping startled the bishtar. The animal set up an ominous squealing, swinging its head from side to side, shifting its feet, and lashing the air with its trunks.

Hasselborg had stood on the wales, holding a stay, where he could leap ashore at the last minute if the animal ran amok. While wondering what all this portended, he noticed a bulge in one of his pockets and remembered that he still had one of the fruits he had bought on the ferry the day before. Some he had eaten, some he had fed to the Avvaú, and the rest he had stowed in his pockets this morning for lunch. Now one was left, a thing that looked like a tangerine but tasted quite different.

Hasselborg stepped near the bishtar's head and called up to the mahout on its neck: "Ohé, there, will he eat this if I give it to him?"

"Yes, sir, that she will," the man said.

Hasselborg extended the fruit in gingerly fashion, fatalistically half expecting the beast to grab his arm in a trunk and beat him to bits against the nearest mast, like a psychologist's child venting its temper on a doll. However the bishtar, after a wary look, put out a trunk and delicately took the fruit. Chomp. Then it stood quietly wagging its ears, since the sails, having filled, were no longer flapping.

"Thank ye, sir," said the mahout.

"No trouble. What's she being taken over for?"

"That I know not. They do say we're to run a double-header to Hershid tomorrow, or perhaps the next day."

"A big load?"

"So I suppose. If ye'd really like to know, ask the station agent in Qadr."

So far, thought Hasselborg, he and Chu'en had assumed that Fallon would simply come into Madjbür in one of his ships, take delivery on his guns, and sail away again to Zamba unless stopped. Could it be that he was planning a lightning descent on Hershid to seize the whole Empire of Gozashtand? It was a little odd for an invading army to come in on the daily train. Come to think of it, however, Fallon's men would be sailors, as out of place on an aya or shomal as a horse on a house top. Moreover such a sudden move by Fallon, outpacing even the rumor of his coming, would catch the dour entirely unprepared.

A fishy smell announced that they were drawing near to Qadr. When they docked at the ferry pier, Fallon watched the railroad men get the bishtar in motion again. The animal got off with much more alacrity than it had shown on the other side and lumbered up the main street, while small tame eshuna ran out of the sagging shacks that lined the street to yowl at it.

Hasselborg, after pleasantly greeting the dour's frontier guards who

loafed on the pier, followed the bishtar to the railroad yard, his boots squelching in the mud. Here he loafed around the station, smoking, until nobody would take him for an importunate inquirer. Finally he got into conversation with the station agent and said:

"That bishtar you fellows brought over on the ferry this afternoon nearly scared the daylights out of the passengers. She doesn't like boats."

"No, that's a fact, they don't," said the agent. "But with the river so wide here we can't build a bridge, so we must needs use the ferry to move bishtars and rolling stock between Madjbür and Qadr."

"Are you planning to run some big train soon?"

"So they tell us. Somebody's coming in with a great crew of men to take to Hershid. Yesterday a man comes up to buy twenty-six tickets in advance. Who he be I know not; howsoever, since he had the gold, we've no choice but to get ready."

They were still engaged in small talk when Hasselborg heard the warning bell from the ferry. Knowing that this was the last trip that day, he had to run to make it, arriving just as the lines were being cast off.

He leaped the two-meter space between the barge and the pier and sat down to puff. He hadn't had time to snoop around for the guns, though this news about twenty-six

tickets for Hershid was probably more urgent.

Chuen seemed to think so, too. "Nothing has come, sir. One large towboat with some baggage aboard, but nothing that could hold machine guns."

"There's no other way from the Koloft Swamp to Madjbur?"

"Are roads from the swamp to Mishé. One runs straight south from Novorecife and the other from the village of Qou at edge of the swamp. So you could take these guns to Mishé and then by big highway from there to Madjbur. I think that unlikely, because it's more roundabout, and also the Order of Qarar polices Republic of Mikardand very thorough. So chances of getting them through would be less."

"It'll be dinner time soon," said Hasselborg, looking at another stunning Krishnan sunset.

"Do you want go eat while I watch river, and then take my place?"

"O.K., . . . say, what's that?"

Up-river, its one lateen sail pink in the sunset, a boat was approaching. Chuen, following Hasselborg's gaze, reached out and gave his companion's wrist a quick squeeze of warning. "It's type of boat I saw used around Qou," he murmured.

As the boat came closer, it resolved into a kind of wherry with a single mast stepped in the bow and eight or ten oars on a side.

"Better get back a little from the end of the pier," muttered Hasselborg.

"Shü. You take base of this pier;

I take base of second pier up," said Chuen. "You got a cigar? I'm all out."

Hasselborg yawned, stretched, and sauntered back towards shore, to resume his loafing against a warehouse wall. Chuen departed up-river.

Hasselborg watched the boat with ostentatious lack of interest. Between the current, the breeze, and the efforts of the oarsmen the boat soon arrived off their sections of the waterfront. Down came the sail with a rattle of blocks, and the boat crawled toward shore under oar-power alone. The crew were tough-looking types, and in front of the tillerman in the stern-sheets lay a large packing case.

The boat was pulling into the dock that Chuen had chosen to watch. Hasselborg strolled in that direction as the boat tied up and the crew manhandled the case ashore. Nobody paid them any heed as they rigged a sling with two carrying-poles through the loops. Two of them got under each end of each pole, put pads on their shoulders, and hoisted the case into the air with a simultaneous grunt. The eight carriers set off briskly towards the base of the pier, the case bobbing slightly and the ropes creaking with every step. Two others of the crew went with them, while the rest sat on the pier, smoking, and waited.

Chuen followed the shore party, and Hasselborg followed a little behind Chuen. After a couple of

THE DOLL



turns in the narrow streets they stopped at the door of a big featureless building with windows high up. Chuen kept right on walking past them, while Hasselborg became interested in the creatures displayed in the window of a wholesale sea food establishment, though the wobbly Krishnan glass made the things seem even odder than they were.

The man who had held the tiller plied the big iron knocker on the door of the house. Presently the door opened. There was a conversation, inaudible from where Hasselborg stood, and the bearer took up their burden and marched into the house. *Slam!*

After a while they came out again; or rather, nine of the ten came out. Hasselborg kept his eyes glued to the sea food, especially one thing that seemed to combine the less attractive features of a lobster, an octopus, and a centipede, as they walked past behind him. He drew a long breath of relief when they went by without trying to stab him in the back.

Chuen popped out of the alley into which he had slipped and came towards Hasselborg, saying: "I looked around back of building. No windows on ground floor."

"Then how do we get in?"

"There's one window a little way up. Maybe two and a half meters. If we had something to stand on, could get in."

"If we had a ladder—and a crow."

"A crow? Bird?"

"No, a pry-bar . . . you know, a jimmy."

"Oh, you mean one of those iron things with hook on the end?"

"Uh-huh. I don't know what they call it in Gozashtandou."

"Neither do I, but can do lots with sign language. One of us must go buy while other one watches."

"Hm-m-m," said Hasselborg. "I suppose whatever they have in the way of hardware stores are closed up by now."

"Maybe some open. Madjbur keeps very late hours."

"O.K., d'you want me to hunt while you watch? My legs are longer than yours."

"Thanks, but better you watch while I hunt. You got sword and know how to use. I don't."

Hasselborg, forebearing to argue, took up his post while Chuen toddled off on his short legs. The polychrome lights faded from the sky and all three of the moons cast pyramidal shadows into the narrow smelly streets. People passed occasionally, sometimes leading beasts of burden. A man whom Hasselborg did not recognize—not one of the boatmen, surely—came out of the building and pushed off on a scooter. Hasselborg was just wondering whether to give his second cigar one more puff or put it out when Chuen reappeared lugging a short ladder.

"Here," said Chuen, thrusting a pry bar with a hooked end into Hasselborg's hand.

They glanced about. As nobody seemed to be in sight at the moment,

they slipped into the alley that led to the rear of the warehouse.

Chuen had neglected to state that the medium-low window opened on a little court or backyard isolated by a substantial wall with spikes along the top. That, however, represented only a momentary check. They set the ladder against the wall, swarmed up it, and balanced themselves on top of the wall while they hauled the ladder up after them and planted it on the ground on the opposite side. Then down again; then to put the ladder against the wall of the warehouse itself.

Hasselborg mounted the ladder first. He attacked the window—a casement-type affair having a lot of little diamond-shaped panes—with the bar. Since he was an old hand at breaking and entering in line of duty, the window presently opened with a slight crunching of splintered wood. He stuck his head inside.

By the narrow beams of moonlight that slanted in through the high windows, and the faint light reflected from a candle out of sight somewhere on the other side of the structure, he could see the tops of what looked like acres of bales, crates, and boxes. No movement; no sound.

Hasselborg whispered to Chuen: "I think we can get down to the floor level from here without hauling the ladder in. I'm going to drop down inside and scout around. If I find it's O.K., I'll tell you to come down after me. If not, I'll ask you to hand me down the ladder, so we'll

have a way out. Got my sword? O.K., here goes."

And Victor Hasselborg slid off the window sill into the darkness inside.

XII.

As Hasselborg's toes struck the wooden top of the nearest packing case, he thanked the local gods for the soft-leather Krishnan boots that let him alight silently. The window sill was about the height of his chin, so that he should be able to get out without much trouble. He stalked catlike around the top of the case, peering about to plan his route. Da'vi was still with him, for an easy route led down by a series of crates and piles of sacks of diminishing heights.

"Chuen!" he whispered. "It's O.K.; we can leave the ladder where it is. Hand me my sword."

Chuen's bulk blocked the dim light through the window as he heaved himself over the sill with surprising quietness for one of his build. Together they stole down the piles of merchandise to the floor and walked stealthily towards the candlelight. Twice they got lost in the maze of aisles between the rows of crates. Finally they came to the corner of the building where the candle was located.

Looking around the corner of a pile of bags, Hasselborg espied a little cleared space, with a desk and a chair, and the candle burning in a holder on a shelf. Just outside the cleared space stood the packing case

they were after. And, in the angle between the case and the wall, a man sat with legs asprawl, sleeping—one of the boat crew.

As Hasselborg moved to get a better view, his scabbard struck against the merchandise and gave forth a faint *tink*. Instantly the man's eyes opened. For two seconds these eyes swiveled before coming to rest on Hasselborg and his companion.

Instantly the man bounded to his feet, holding a scimitar that had lain on the floor beside him, and sprang towards the intruders. Hasselborg jumped away from the crates to get elbow room and drew his sword. The man, however, went for Chuen. The curved blade swished through the air and met the pry bar with a clank.

Hasselborg stepped towards them and cut at the man, who saw him coming and skipped away before the blow arrived. Then he came back again, light and fast, cutting right and left. Hasselborg parried at best he could, wishing he were an experienced swordsman so that he could skewer this slasher. *Clong, dsing, thump!* Chuen had stepped behind the man and conked him with the crow. The man's saber clanged to the floor and the man followed it, falling to hands and knees.

He shook his head, then reached for his sword.

"No you don't!" said Hasselborg. In his excitement he spoke English, but nevertheless got his meaning across by whacking the outstretched hand with the flat of his blade.

"*Ao!*" cried the man, nursing his knuckles.

"Shut up and back up," said Hasselborg, remembering his Gozash-tandou.

The man started to comply, but Chuen landed heavily on his back, flattening him out, and twisted his arms behind him.

"*Amigo,*" said the Chinese, "cut length of rope off one of these bales and give it to me."

Hasselborg did so, wondering if there weren't some easier way of making a living. While during hot action he never had time to be afraid, it gave him a queasy feeling when he came to reckon up the odds afterwards. When the man's wrists and ankles had been secured, they rolled him over and shoved him roughly back against the wall.

"Like to live?" asked Hasselborg, holding his point under the man's chin.

"Of course. Who be ye, thieves? I but guard the goods while—"

"Pipe down. Answer our questions, and in a low voice, or else. You're one of those who came down in the boat from Koloft, aren't you?"

"Yes."

"Wait," said Chuen. "What's become of the regular watchman?"

"Gone reveling. There's a place near here he's long craved to visit, but can't because their working hours be the same as his. Since I was to stay the night anyway, I told him to take himself off whilst I watched."

Chuen looked at Hasselborg, who nodded confirmation, saying: "I saw the man leave this building while I was waiting for you." Hasselborg then asked the riverman: "Where's the rest of your boatload?"

"Out on the town, even as the watchman, may Dupulán rot his soul!"

"When do they shove off?"

"Tomorrow, as soon after sunrise as their night's joys'll let 'em."

"D'you know whom this box is for?"

"The Dour of Zamba, so they say."

"Do you know this dour? Have you ever seen him?"

"No, not I."

"When's he due in Madjbur?"

"Tomorrow ere sunset."

Chuen interposed: "Whom did you get this box from in the first place?"

"Earthman at Novorecife."

"What Earthman?"

"I . . . uh . . . know not his name; some unpronounceable Ertsou—"

"You'd better remember," said Hasselborg, pricking the man's skin with his point. "I'm going to shove—"

"I know! I remember! 'Twas Master Julio Góis! Take away your sticker!"

Hasselborg whistled. "No wonder he tried to have me bumped off!"

"What's this?" asked Chuen.

Hasselborg told of his experiences with the Dasht of Rúz.

"Of course!" said Chuen. "Think I know. He didn't believe your story about Miss Batruni and took you for man after the guns. I wouldn't have believed it myself."

"But why should Góis go in for a smuggling scheme of this kind? What would he stand to gain from it?"

"No need for material gain. He's . . . ah . . . fanatic about progress."

"So that's why he said that no matter what happened, always to remember that he esteemed me! The twerp liked me well enough as a man, but since I threatened his world-changing scheme, as he thought, I'd have to be liquidated."

"Undoubtedly." Chuen turned back to the prisoner and switched to the latter's tongue, asking for more details. The few he got, however, were not such as to change the general outlines of what they already knew.

"I think you've pumped our friend dry," said Hasselborg at last. "Let's have a look at the crate."

With the pry bar they soon ripped the crate open. Inside, ranged in a double row in a rack, were twenty-four well-greased Colt-Thompson 6.5-millimeter light machine-rifles. A compartment at the bottom of the crate held thousands of rounds of ammunition.

Hasselborg took one gun out and hefted its four kilos of weight. "Just look at these little beauties! You can adjust them for any reasonable rate of automatic or semiautomatic fire; you can set this doohickus to

fire in bursts of two to ten shots. With one of these and plenty of ammunition I'd take on a whole Krishnan army."

"No doubt what friend Fallon has in mind," said Chuen. "Now that we got them, what shall we do with?"

"I was wondering myself. I suppose we could tote them an armful at a time down to the river and dump them in."

"That would fix Fallon's plans, all right, but then where would evidence be?"

"What evidence?"

"Evidence against smuggling ring. I don't care much about King Anthony. Lots of disguised Earthmen adventuring around Krishna, and if we get rid of him there will just be another soon. Main thing is to bust up gang inside *Viagens Interplanetarias*."

"Let me think," said Hasselborg. "By the way, now that we've drained this gloop, what'll we do with him? While we can't very well let him go, I don't like to kill the guy in cold blood."

"Why not? Oh, excuse, I forget you're an Anglo-Saxon. If not kill him, then what?"

Hasselborg felt in his pockets. "I think I've got it. Where's a pitcher and a glass?" He rummaged until he found a brass carafe and mug.

"What are you doing?" asked Chuen.

"See this? It's a trance pill

that'll lay him out cold for a couple of weeks."

"I don't see how Novorecife authorities let you take that out."

Hasselborg grinned. "This is one they didn't know about. Or rather they thought it was an ordinary longevity pill. You might say it is, in a way, since I'll have a better chance of a long life on account of it."

"What are you going to do?"

"Knock him out, move the crates around to make a hiding place, and leave him there with enough air to keep him alive till he wakes up. In this mare's nest we can hide him so it'll take a month to find him."

"All very well, but what when watchman come back? And what about the guns?"

Hasselborg had set down his water and was toying with the machine gun, working the bolt and squinting along the sights. He was careful to keep the muzzle pointed away from the others.

"Let's see—" he said. "I used to be able to strip and assemble these blindfolded." He unscrewed a wing-nut and took out the bolt mechanism. "As I recall, one of the tricks they played on us in the Division of Investigation was to wait till we had the parts all laid out, then steal the firing pin while we were sitting there blind, and hope we'd put the gun back together without it. Maybe we could—"

"Take out firing pins—" said Chuen.

"And reassemble the guns—"

"Then let Fallon pick up guns—"

"Yes, while I tear back to Hershid and get my private army!"

Hasselborg and Chuen slapped each other's backs in sudden enthusiasm. Then the former said:

"But still we haven't disposed of the janitor. When he comes back and find nobody—"

"He'll think his companion went off for fun too, yes?"

"Maybe—"

"I know," said Chuen. "We put this man to sleep, disarm the guns, nail crate back together. Then I disguise myself with this man's hat and sword like member of the boat crew. I look more like Krishnan than you. I tell watchman I'm member of the boat crew who relieved this man during night so he can have fun too. Then I leave in morning, saying I got to catch boat back to Koloft. Really I hang around to make sure Fallon get the guns. Meantime you take your buggy and ride back to Hershid like you said, catch Fallon, and turn him over to me."

"Yeah, but when the boat crew find a man missing—"

Chuen shrugged. "We hope they think he got lost in a dive and go off without. I'll be ready to duck if they come around looking for him anyway."

Hasselborg looked at his machine gun with narrowed eyes. "Chuen, how badly do you want Fallon?"

"Ah . . . so . . . so. Don't care much so long as I get Góis and other Viagens conspirators. I suppose

since Fallon conspired to break regulations I should bring him in, too. Why?"

"I was thinking that my need may be greater than thine."

"How so?"

"I'm supposed to bring Miss Batrani back to Earth. Now, I can't drag her aboard a spaceship; the minute I get her inside the wall at Novorecife she'll be under Earth law."

"Yes?"

"If you did bring Fallon in to Novorecife, what would happen then?"

"I'd present evidence at preliminary hearing before Judge Keshavachandra, who would order a trial. If he's convicted, go to jail. That's all."

"He'd be tried on Krishna?"

"Yes."

"How about appeals?"

"Interstellar Circuit Court of Appeals take care of that. Visit Krishna every couple years to hear appeals. What are you getting at?"

"I wondered if there were any way of having him tried on Earth. You see, if he were dragged back to Earth, Julnar Batrani would probably come back to Earth without urging. Follow me?"

"No chance. Fallon's offenses were all committed on Krishna."

"In that case, chum, I think I do need him more than you do. You see I'll need some hold on Miss Batrani, and at the moment I can't think of a better one than to leave Fallon under duress here."

"Oh. Wouldn't that get you in trouble with Earth law, being accessory to false imprisonment or something?"

"No it wouldn't, since the imprisonment would be on Krishna outside of Novorecife. If this were a planet with extradition, it might make me liable to trouble, but it isn't, since they haven't yet got habeas corpus and things like that."

"I see. But look, *companheiro*, maybe if Fallon is in jail at Novorecife, Miss Batrani would go back to Earth for not knowing what else do, don't you think?"

"Might, or might not. Maybe she loves him enough to stick around Novorecife to be near him; or maybe she'd go back to her island and tell the Zambans: 'Your king's in the clink, so as queen I'm running the joint for him until he gets out.' Women rulers are fairly common on this part of Krishnan. No, I think my scheme is the only one I can count on."

"How will you manage it?"

"I haven't worked it all out yet, but I've got an idea. With your help I'm sure we can put it across."

They sat looking at each other by candlelight silently for a full minute. Hasselborg hoped Chuen would accede without making an issue of the case. Chuen was a good man to work with, but by the same token would be a dangerous antagonist. He hoped he wouldn't have to resort to threats to elicit further co-operation.

Chuen finally said: "I'll... ah..."

make deal. I help you catch Fallon the way you said. Then if I can get deposition from him against Góis, to help my case there, I'll let him stew in own soup. If authorities at Novorecife want him, I'll try dissuade them; tell them they'd need an army to catch him, and anyway he's turned state's evidence, and thing like that. If they insist I bring him in, I'll have to try. You understand?"

Hasselborg thought a while in his turn. He finally replied: "O.K. Let's go to work."

While Hasselborg forced his trance pill on the unwilling riverman, Chuen picked up the curved sword. "Thought I'd never use one of these, but since I stopped that cut with the pry bar I begin think I'm made swordsman, too. How you say in the Old English? Ha, villain!" He swished the blade through the air.

XIII.

The keepers of the city gate at Hershid, knowing Victor Hasselborg as the savior of the Lady Fouri, waved him through without formal identification. It had rained almost continuously since he had left Madjbur, and a few sneezes had filled him with more acute fear than all the fighters in Krishna. Although he wanted nothing so much as to curl up in bed with his pills until the threat of a cold disappeared, however, he drove straight to Hasté's palace and dashed in.

"Your reverence," he told the high

priest, "you told me when I first arrived here that you'd do anything I asked in return for my small services to your niece. Is that right?"

"Yes, my son?"

"Well then, here's where I foreclose." He smiled disarmingly. "It won't be too terrible and it won't cost the True Faith anything. First I'd like you to send one of your flunkies over to the royal palace and tell Ferzao bad-Qé, the leader of my men-at-arms, that I want them all to report over here on the double, with their arms and their ayas and a couple of spares."

"Master Kavir, the king has been asking after you. Hadn't you better pay your respects to him? He's impatient—"

"That's just the point! I don't want the king to know I'm in town, because he'll want me to paint his picture, and I've got more urgent things to do. Second, will you have somebody go out and buy me some fireworks? The kind you light and hold out, and they shoot out colored fireballs."

"It shall be done, my son."

"Thanks. And finally, will you prepare one of those cells in your basement for an unwilling guest?"

"Master Kavir! What are you about? I trust that you seek not to lure me into sinful acts under the guise of gratitude."

The guy's beginning to waver, thought Hasselborg, remembering King Eqrar's remark about the priest's habit of promising anything and fulfilling nothing. He de-

cided that the way to deal with Hasté was to be brisk and domineering. "You'll see. Nothing against the best interests of Gozash-tand. And it's absolutely necessary; I have your promise, you know."

Fouri came out and greeted him formally. When Hasté was occupied in giving orders, she murmured: "When can I see my hero alone? I'm aflame with longing for him! I cannot sleep—"

This is where I came in, thought Hasselborg. He managed to be brightly conversational and completely uninformative during the next half-hour while his preparations were being made.

He said: "If the king asks, tell him I've gone hunting with my men. It's no lie, either." And he strode out to his carriage.

Back on the road to Madjbür they sped. Hasselborg, observing that the sun was lowering, hoped they'd catch the invaders before sunset. He was driving one of the spare ayas he'd bought for his little army, since he had nearly killed poor Avvaú to reach Hershid ahead of Fallon. They might meet the train any time, since, while the aya could outsprint the bishtar, the larger beast could keep up a higher average speed for long distances than any other domesticated animal.

Presently Ferzao bad-Qé cantered up beside him and pulled down to a trot. "Master Kavir," he said, "methinks I see something far ahead on yonder track!"

Hasselborg looked. Sure enough the track, which stretched away across the plain on their left, parallel to the road, ended in a little spot. As they approached, the spot grew and grew until it became two bishtars in tandem pulling a dozen little cars.

"You've got your orders," said Hasselborg. "Go to it."

Ferzao halted and deployed his men. One of them handed him a Roman candle, which he lit with flint and steel. As the fuse fizzed, the sergeant galloped across the moss towards the leading bishtar, holding the firework in front of him like a lance. At the same time the other twenty-eight set up a yell, banging on their brass bucklers with their mailed hands to augment the din.

The Roman candle spat fireballs at the bishtar. A couple bounced off its slaty hide, while its mahout yelled in terror. The animal screamed and lumbered off across the plain away from its tormentors, dragging its fellow after it. Behind the second bishtar the first of the little cars left the rails; the next teetered and fell over on its side.

A mighty chorus of yells arose from the train, and two dozen men in sailors' dress tumbled out of the remaining cars with Colt-Thompson machine guns. With a disciplined movement the sailors dashed out and flung themselves down on the moss in a line of skirmishers.

Hasselborg's men galloped to-

wards them with lances couched and arrows nocked. Up came the guns.

"*Passoi!*" shouted a voice from the train. A multiple click came from the twenty-four guns.

"Surrender!" shouted Ferzao. "Those things won't work!"

He pulled up a few feet in front of them. A couple of sailors worked their bolts and tried again with no better success, while the rest, in the face of the lances and drawn bows, threw down their guns and rose to their knees, arms extended in token of surrender.

"What's all this?" yelled a voice, as a tall gaudily-dressed person walked across the moss from the train.

Hasselborg recognized the handsome heartbreaker of the photographs under the Krishnan makeup. With him came a splendid-looking dark girl, and behind them the stocky form of Chuen Liao-dz. "What sort of reception—"

"Hello there, Fallon," said Hasselborg, who had secured his reins and, like Fallon, followed his army on foot to the scene of the battle.

"Who's speaking English? You? Are you—"

"Careful, chum; if you don't give me away I'll do the same for you. Officially I'm Kavir bad-Ma'lum, portrait painter by appointment to His Awesomeness King Eqrar of Gozashtand. Unofficially I'm Victor Hasselborg of London."

"Oh, really? Well, what do you think you're doing—"

"You'll learn. Meanwhile keep calm, because I've got the advantage. This is Miss Julnar Batruni, isn't it?"

"Our wife!" growled Fallon. "Her Resplendency Queen Julnar of Zamba, if you please!"

"Seems to me you already had one wife in London, didn't you? She sent her regards."

"You didn't come clear from Earth to tell us that! Anyway it's not exactly true. We fixed things up."

"How?"

"Why, we divorced her and married Julnar under Zamban law."

"How convenient! I'll be judge, I'll be jury, said cunning old Fury. Delighted to know you, Queen. Mr. Batruni sent me to find out what had become of you."

"Oh, is that so?" said the girl. "Well, now that you know, why don't you go back to Earth and tell the old dear, and take your nose out of our affairs?"

"Uh . . . well, the fact is he commissioned me to bring you back if possible."

"You—" shouted Fallon, and tugged at his sword.

"Grab him!" said Hasselborg. Two of his men pounced on Fallon, twisted his arms behind him, and took his sword away.

"Naughty, naughty," said Hasselborg. "Now let's continue more calmly. As I was saying, Miss Batruni . . . pardon me, Mrs. Fallon . . . or Queen Julnar . . . your father's

lonesome and would like to see you again."

"Well I . . . I do love the old fellow, you know, but one can't leave one's husband and run home four or five light-years for a week-end. Won't you please let us be? I'll write Father, or send a message, or anything like that—"

Hasselborg shook his head. "We'll have to go into this further. King Anthony, will you please mount this aya? One of my men will lead it for you, and don't try any breaks. Chuen, here's one for you—"

"Oh," said Chuen, looking apprehensive. "Is no other way to go?"

"No; I'm taking Miss Ba . . . the young lady . . . with me."

"You know this fella?" said Fallon to Hasselborg. "Who is he?"

"He's Master Liyao, who's looking into the disappearance of certain machine guns from . . . uh . . . from the mails, if you follow me. How did you get on the train with the rest, Chuen?"

"Bought ticket; told some lies about how my old uncle was dying in Hershid, so they let me ride in Fallon's special. What you doing with the Zambava?"

"Sending 'em back. Hey, you there!" Hasselborg called to the mahouts, who were just getting their beasts calmed. "Special's canceled. Break the train and hitch one of those bishtars to the Qadr end of the passenger coaches. Now, you!" He addressed the sailors, collected in a glum and muttering group. "You

know you were caught invading Gozashtand with arms, don't you?"

They nodded.

"And it would go pretty hard with you if I turned you over to the dour?"

A sailor asked: "Don't ye work for him, master?"

"As it happens I don't, though he and I are good friends. Wouldn't you like to be carried back to Qadr, and nothing said about this?"

"Aye, sir!" cried several of the Zambava with a sudden access of interest in life.

"O.K. Ferzao, detail a couple of men to see these boys off to Qadr in the train. Have somebody help get those derailed cars back on the track. Assign somebody to lead King Antané's aya, and a couple more to shoot him if he tries a break. We'll tell the guards at the gate that we're just back from the hunt, and hope they won't count us. You there, pick up those guns and load 'em into the carriage."

"I say," said Fallon, "what happened that those guns didn't shoot? We're told they were all right when they arrived on Krishna."

"Trade secret; tell you some day," said Hasselborg. "Queen Julnar, will you do me the honor? Don't look so scared, Chuen!"

"Is long way to the ground," said Chuen, peering down from his uneasy saddle.

"Not so far as it looks. And weren't you kidding me about being scared of germs?"

"Where are you taking us?" demanded Fallon. "To King Eqrar?"

"Not yet. Keep quiet and behave yourself and perhaps you won't have to meet him at all. *Hao!*"

Hasselborg cracked his whip, and his buggy headed back for Hershid at a canter through the sunset.

Hasté stroked the arm of his chair with long fingers. "No, I'll see the fellow not, until this matter's settled. Till then I've no official knowledge of his presence."

"Well," said Hasselborg, trying without complete success to conceal his exasperation, "will your reverence do what I ask, or won't you?"

"I know not, Master Kavir. I know not. 'Tis true I promised, but things have changed since then. I fain would help you, yet you ask a thing bigger than the Six Labors of Qarar. For look you, these sailors will arrive back in Madjbur, and nothing on Krishna will stop them from talking. The talk will come to the ears of Gorbovast, who'll report back to the king, who will naturally wonder what befell him who led this strange invasion. He'll know you carried King Antané off, and the people of the city saw you drive up to my palace with your retinue. Therefore he'll come snooping around here with armed men at his back, and if he finds Antané locked in that old cell there'll be awkward queries to answer."

Hasselborg said: "I think we can divert him. Tell him I took Antané



with me to Novorecife. He won't be able to catch me to find out, I hope."

"Surely, you put a fair face on things. Still, I know not—"

"Well, there it is. If you want to carry out your promise—" Privately Hasselborg was more and more sharing the king's opinion of his vacillating high priest.

"I'll tell you. I'll do it on one condition."

"What's that?"

"It has not escaped your attention that my niece Fouri entertains for you feelings warmer than mere esteem?"

"Uh-huh."

"Well then, let you wed her by the rites of our most holy Church, and I'll undertake to keep your prisoner till you send me instructions for his disposal, as you demand."

Of course neither Hasté nor Fouri yet knew he was an Earthman, and moreover that he intended to return to Earth as soon as he perfected arrangements here. Legally it wouldn't much matter. Once he got away from Gozashtand he could nullify the marriage or ignore it, as Fallon had done with his.

Still, he disliked doing such a serious thing—serious to Fouri at least—under false pretenses.

"Well?" said Hasté.

Now Hasselborg was squirming on the horns of the dilemma, as Hasté had been previously. Should he balk at this point, throw up the game, turn his captives over to King

Eqrar, or to Chuen, and report failure back to Batruni? It would simplify matters with Alexandra.

No, having come this close to success, he wouldn't let himself be finessed out of it.

"O.K.," he said. "How about as soon as I get back from where I'm going with the queen?"

"No; ere you leave. This night."

Away went that chance of escape. "All right. Whenever you say."

Hasté broke into a weary smile. "I had long hoped that the wedding of my niece would be a splendid affair. I should, for example, have consulted the ancient astrological archives to calculate the most auspicious date. However, Fouri insists upon an immediate ceremony. Therefore 'twill not even be necessary to compute your horoscopes." Hasté looked at the time-candle. "'Tis the hour for supper. What say you we perform it now, as soon as we and our friends can make ourselves presentable? Then to sup."

This was going to put Hasselborg in still more of a spot, unless he found a reason for setting off into the darkness right after supper. Yet, at this stage of the game it wouldn't much matter if Fouri found out that he was an Earthman.

"Very well," he said amiably, "but I'm afraid I'll have to get married the way I am, since all the rest of my clothes are over in Eqrar's shack."

He went to the room that Hasté assigned him, shaved, washed up, took a short nap, and then came out

to prowl the palace. He knocked on Julnar's door.

"Yes?"

"Queen Julnar? This is the *soi-disant* Kavir bad-Ma'lum."

"What is it, fiend?" She opened the door.

"I thought you might like to attend the wedding."

"Wedding? Who? Where? When? How divine! I'd love to!"

"It seems that Hasté's niece Fouri and I are getting hitched in about fifteen minutes in his reverence's private chapel."

"You are? But how can you if you're an Earth—"

"*Sht!* That can't be helped, and I don't want it spread around. Just say, would you like to come?"

"I'd adore it! But . . . but—"

"But what?" asked Hasselborg.

"I couldn't very well accept while you're holding my husband in that wretched little cell, could I? That wouldn't be loyal."

"I'm sorry, but—"

"My idea was, why not let him out long enough to attend? Tony's a good sport, and I'm sure he'll behave."

"I'll see."

He went downstairs to Fallon's cell, finding the erstwhile king comfortably settled and playing Krishnan checkers with Ferzao. He said to the captive:

"Tony, I'm getting married to Hasté's niece in a few minutes, and your . . . uh . . . wife said she'd like

to attend if I'd let you come, too. Would you like to?"

"We most certainly should!" said Fallon with such emphasis that Hasselborg looked at him in alarm.

Hasselborg warned: "Don't nourish ideas of making a break, chum; I'll have you well guarded."

"Oh, we won't bother *you*. Word of honor and all that."

"O.K. Ferzao, you and Ghum let King Antané out and take him up to the high priest's private chapel in a few minutes. Stick close to him and watch him."

Hasselborg then went to the chapel itself, finding Hasté, Fouri, Chuen, Fouri's maid, and Julnar. Fouri looked at him with a hungry expression that reminded him of those Earth female spiders that ate their mates. Julnar, Hasselborg had decided, was just a healthy normal girl, impressionable perhaps, but with a wonderful shape that the topless Krishnan evening-dress made the most of.

Hasté said: "I will run through the forms once, to forewarn you of the responses you must make. You stand there and Fouri there. You take her hand in yours, so, I say—Who's this? Take that man away!"

Hasselborg turned to see Fallon and his two guards. "Which man?" he asked.

Fallon cut loose with a shout: "Hasté, you double-crossing—"

"Silence! I forbid you to speak!" cried Hasté.

Fallon paid no attention. "You double-crossing *zeft*, we'll see that you get . . . *ohé*, watch him!"

Hasselborg turned to see the high priest cock a little one-hand pistol crossbow and aim it in the general direction of Fallon. Fallon and his two guards ducked frantically. So did everybody else in the room except Hasselborg and Chuen.

While Chuen looked around for something to throw, Hasselborg, who was standing closer to Hasté, brought his right foot up in a terrific kick at Hasté's hand. The twang of the string mingled with the smack of Hasselborg's boot, the little crossbow flew high into the air, and the bolt struck the ceiling with a sharp sound and buried itself in the plaster.

Hasselborg threw himself upon Hasté in a tackle. Down went the priest, gorgeous robes and all. Hasselborg heard one of his men gasp at the sacrilege.

"Really, my son," said Hasté when he got his breath back, "be not so rough with one who is no longer young!"

"Sorry," said Hasselborg. "I thought you were reaching for a knife. Anyway, who told you you could plug Antané? He's my prisoner, see?" He got up with a grunt, feeling as if he had dislocated a hip joint. You are old, Father Victor, he thought, at least for football practice. "Say!"

"What?" Hasté sat up.

"This!" Hasselborg reached out and yanked off one of Hasté's an-

tennae, which had become partly detached in the scuffle. "An Earthman, huh?"

Hasté felt his forehead. "Yes, now that you make mention thereof." Then as the significance of the event sank in, Hasté did a double-take; the rather stupid expression on his face changed to one of horror: "Speak it not, my s-s-son! I p-pray you! The results were dire! I were slain; the Established Church were overthrown; the bases of morality and justice were destroyed! Anything shall be yours, so that you betray not this dread s-s-secret!"

"Oho, so that's it? You were in on this smuggling deal too, eh? And you tried to murder Fallon just now because he was going to give you away?"

"That were a harsh interpretation, my boy. I . . . I c-can explain, though 'twere a lengthy tale—"

"Huh. No wonder you wouldn't see him when I brought him in! Well, that simplifies things. Sorry, Fouri, wedding's off."

"No! No! I love only you!"

He ignored her cries, not without a small internal pang. But then, he hoped to see Alexandra soon. He continued:

"Hasté, I'm pulling out tonight with Queen Julnar. You'll put Fallon back in his cell and hold him on pain of exposure. Moreover you'll carry out any instructions I send you with regard to him; meanwhile you'll make him as comfortable as possible. You'd also better pension

Ferzao and Ghum to keep their mouths shut. Follow me?"

"I understand. But tell me one thing, my son—I've long suspected that you, too, are of the race of Earthmen. Be that the truth, or—"

"That's my business, chum. You understand, Julnar? You'll do just as I say, or I'll get word to Hasté to put your boy friend out of his misery?"

"I understand, you fiend."

"Chuen, you'll want to stick around, won't you?"

"Yes," said Chuen. "I got to collect depositions and other evidence."

"O.K. then—"

"But!" cried Julnar. "If I go back with you, it'll be years by Krishnan time before I can see Tony again, even though it seems only weeks to me!"

"I'll fix that," said Hasselborg, fishing out his precious pills. "Here, Tony. Trance pills. Know the formula?"

"Certainly we do," said Fallon sullenly.

"Fine. Hasté, before I go, I want to borrow the amount I left in my rooms in the royal palace. I'll give you a note, and after I've left you can take it around to the palace. If King Eqrar's feeling honest, maybe he'll let you have the stuff. Ferzao, put King Antané back in his cell; then choose half the men to come with me to Novorecife. The other half I'm turning over to Master Li-yao, to do as he commands, together with the money to pay them. Then

get my carriage ready, with food for a long fast journey. And cups of hot shurab for Queen Julnar and me before we start—"

Hasselborg was well away from Hershíd, trotting briskly through the multiple moonlight, when Julnar asked: "Isn't this the road back to Madjbur?"

"Uh-huh."

"Well, isn't that a roundabout way of getting to Novorecife?"

"Yes; we're going up the Pichidé by boat. The only other route lies via Rosíd, and I'm afraid I'm not popular in Rúz just now."

She relapsed into gloom. The escort clop-clopped behind them. Hasselborg suddenly clapped a hand to his forehead.

"Tamares! It just occurred to me: if Hasté's an Earthman, Fouri can't be his niece, unless she's human too . . . say, d'you know anything about their background?"

"No," said Julnar, "and if I did I wouldn't tell you, you home-wrecker!"

Hasselborg subsided. As far as he was concerned, the many loose ends in this case would have to be left adrift. And he must remember to send Yeshram bad-Yeshram the jailer the other half of his bribe. He grinned as he thought how much easier it was to be ultra-scrupulous with Batruní's money than with his own.

XIV.

Hasselborg walked down the ramp from the side of his ship at the Barcelona spaceport, followed by Julnar Batruni. Her suitcase had already gone down the chute; he insisted on carrying his own by hand rather than risk his professional equipment and medicines. In the other hand he twirled the carved Gozashtando umbrella, an incongruous sight in this sunny city.

"What now?" she asked as they stood in line at the passport desk.

"First I'm going to wire your old man in Aleppo, and a . . . a friend of mine in London. Then I'll hunt up a doctor for a physical checkup."

"Why, are you sick? I thought the Viagens doctor checked you."

"So he did," he said seriously, "but you can't be too careful. Then I thought we'd take in some of the high life. While most of its *estinamente*, I know some good places over on the Montjuich."

"How simply divine! You're an extraordinary man, Victor," she said.

"How?"

"I don't seem to be able to loathe you as much as I should for breaking into my life."

"That's my insidious charm. Watch out for it." He handed over his passport.

He had just finished sending his telegrams when somebody at his elbow said in Spanish: "Excuse me, but are you Señor Hasselborg?"

"*Si, soy Hasselborg.*" The fellow was dressed in the uniform of an Iberian Federation cop, and flanked by two Viagens men.

"*Lo siento mucho,*" said the Spaniard with an apologetic bow, "but I must place you under arrest."

"Huh? What for?"

"These gentlemen have a warrant. Will you explain, Señor Ndombu?"

One of the Viagens men, a Negro, said: "Violation of Regulation 368 of the Interplanetary Council rules, Section Four, Subsection Twenty-six, fifteenth paragraph."

"Whew! Which is that?"

"The one relating to the introduction of mechanical devices or inventions on the planet Krishna."

"I never—"

"Queira, senhor, don't savage me about it! All I know is what's in this warrant. Something about putting a sight on a crossbow."

"Oh." Hasselborg turned to Julnar. "Here's some money. Take a cab to the Cristóbal Hotel. Call up the firm of Montejo and Durruti and tell 'em to bail me out of the *caboso*, will you like a good kid?"

Then he went with the men.

Whether Julnar took the chance of getting even with him, or whether his Catalan colleagues were having an attack of *mañana*, nothing happened to get Hasselborg out of his cell as evening came on. This could be serious. They had the goods on him with respect to those sights, even if they were only a pair of

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corsage pins. The spectators had taken note at the time, and the imitative Krishnans were no doubt spreading the device all over their planet. Not that it was really important; a man's as dead when beaten to death with a club as when blown up with a plutonium bomb.

There'd be a hearing, whenever the local magistrate got around to it, at which said magistrate would either dismiss the case or bind Hasselborg over and assign him to the court of first instance for trial. For an offense by an Earthman on Krishna against an Interplanetary Council regulation enforced by the *Viagens Interplanetarias* security force, and arrested in Iberia on Earth, that would be—let's see—Lower Division, Earth World Court for the Third International Judicial District, which sat in—hm-m-m—Paris, didn't it? With appeal to—He'd have to dig out his old law texts when he got back to London. The maze of jurisdictions was so complicated that sometimes interplanetary cases simply got lost in the shuffle and never were tried at all, while the principals lived out their long lives on bail.

"No, if he got back to London. This could result in a stiff sentence, especially if Chuen broke a big scandal inside the *Viagens* ranks about now, and the word was passed down to tighten up and make an example. And it did no good to have a trance pill smuggled in to knock yourself out with; Earth penal systems were wise to that one, and simply added

the time you spent in trance to your sentence.

Hasselborg reflected that he who acts as his own lawyer has a fool for a client. He'd better round up some high-powered advice *muy pronto*. Lawyer though he was by training, he was too rusty to cope with this problem himself. Maybe he should have stuck to law in the first place, instead of getting involved in investigation. The glamour of detecting soon wore off—

Obviously Montejo and Durruti weren't going to call, whatever the reason. Although the jail people let him telephone, their office didn't answer, he didn't know their home numbers, and the directory listed so many Montejos and Durrutis that he decided that it would take all night to go through them.

Next he tried the Cristóbal Hotel. No, they had no Miss Batruni. Nor any Señora Fallon either. Did they have the Queen of Zamba? Come, señor, you are joking with us and we do not appreciate . . . oh, wait a minute! We have a Hoolnar de Thambq; would that be the one?

But Julnar's room did not answer. Hasselborg disgustedly went to bed. At least the Barcelona municipal clink, unlike many in the Peninsula, was a reasonably sanitary one, though Hasselborg doubted whether any Iberians could be trusted to display sufficient vigilance towards germs.

Hasselborg was at the telephone again next morning when a warden

said: "A Señorita Garshin to see you."

He hung up unsteadily, missing the cradle with the handset twice, and followed the man to the visitors' room. There she was, looking just as he'd imagined her, only prettier if anything.

"Alexandra!" he said. "I . . . you . . . you're *Miss* Garshin now?"

"Yes. Why Victor, your *hair*!"

"It's green, isn't it?"

"You mean you see it, too? I thought I was having hallucinations."

"It's just the ends; it'll be gone the next haircut I get. You don't look different—not a day older."

"I've been in trance most of the time; that's why."

"You were?"

"Yes," she said.

"But . . . I'm afraid . . . I didn't bring back Tony after all."

"Oh, I didn't do it on Tony's account. I don't care anything about him any more."

"Then . . . uh . . . whose?"

"Can't you guess?"

"You mean you . . . uh . . . you—"

She nodded. He held out his arms, and the warden, who thought of Anglo-Saxons as cold fish, received a surprising enlightenment.

He brought out the little Krishnan god, which he had been carrying in his pocket for this moment, and gave it to her. Then they sat down holding hands. Hasselborg found that the paralysis of his vocal organs had

vanished. They talked at a terrific pace of their past, present, and future until Hasselborg looked at his watch.

"Say," he cried, "I forgot I haven't even got a lawyer yet! Wait a minute, will you, chum?"

He dashed back to the telephone, this time getting Montejo and Durruti, who promised to send him a lawyer forthwith. The lawyer was arranging bail when the warden announced more visitors—a Señor Batruni and a lady.

Batruni practically slobbered over Hasselborg in gratitude. When the investigator finally wormed out of the emotional Levantine's embrace he introduced Alexandra simply as "my fiancée Miss Garshin". Then he asked Julnar:

"I thought I asked you to call Montejo and Durruti for me yesterday?"

"I would have, Victor, only—"

"Only what?"

"Well, you see, the stupid taxi driver must have misunderstood me and took me to the wrong place, so we got into an argument, and what with me not speaking any Spanish or Catalan and he not speaking any English or French or Arabic it was simply ghastly—and what with one thing and another, by the time I did get to the Cristóbal I'd forgotten the name!"

"Then why didn't you call me at the jail and find out?"

"I didn't think of that."

"Where were you during the eve-

ning, and again this morning when I called you?"

"In the evening I went to a movie, and when I got back to my room Daddy called me by telephone from Aleppo to say he was chartering a special fast plane. So this morning I was so excited I left early to wait for him at the airport."

Hasselborg sighed. Nice girl, but too scatterbrained for his taste.

"Has Daddy told you the news?" she continued. "Of course not; he just arrived. Tell him, Daddy."

"I am going back to Krishna with Julnar," said Batruni.

"Why?" said Hasselborg.

"It is this way. While you were gone the government socialized my factories. They paid me for them, so I need not starve, but there is no more fun in life. I even offered to act as manager; but they turned it down. They do not trust a wicked capitalist to run them without sabotaging them. There is no pleasure on Earth any more. Everything is too orderly, planned, regulated. You cannot move a meter without tripping over red tape."

"Therefore, if you will give me a letter directing that person who has Anthony in custody to let him go, I will go to Krishna and live with this wild son-in-law of mine in his island kingdom. I shall be a genuine prince, which you cannot be on Earth any more unless you are a Swede or an Ethiopian."

"Isn't it just too divine?" squealed Julnar. "Now I'm really grateful to you for kidnaping me!"

"Swell," said Hasselborg. "I hope you're satisfied with the way I carried out the assignment, Mr. Batruni."

"Certainly, more than satisfied. In fact I am so pleased that I have an offer to make to you."

"Another job?" said Hasselborg in slight alarm.

"Yes, but not the kind you think. In addition to my regular fee I am offering you a lectureship at the University of Beyrût, of which I am a trustee."

Hasselborg paused to let this sink in. "A lectureship in what?"

"Anglo-Saxon law."

"My word! I'd have to think, even if I beat this rap; but my sincerest thanks. I'd have to brush up on my law and my Arabic. Say, how about seeing the sights of Barcelona? I promised Julnar, but got pinched before I could deliver. Come on; 'tis a privilege high to have dinner and tea, along with the Red Queen, the White Queen, and me!"

The hearing took place the following morning. In the front row, like Alice between the two queens, sat Papa Batruni, showing signs of a hangover, with his daughter on one side and Alexandra on the other. The magistrate had just called the case when a bulky Oriental walked down the aisle.

"Chuen!" cried Hasselborg, then to his lawyer: "Señor Agüesar, there's the man we want!"

Chuen shook hands warmly. "I just arrived and learned you were in pokey. I left several days after you, but in faster ship."

"I always get the scows," said Hasselborg, and explained his plight.

When the Viagens officer, Ndombu, had explained the warrant, Agüesar called Chuen to the stand. Chuen, using an interpreter, told what had happened on Krishna, emphasizing the fact that only by a slight infraction of the anti-invention regulation had Hasselborg been able to survive to forestall another and much graver violation.

"Case dismissed," said the magistrate.

Hasselborg asked Chuen: "Could you stay over two days and act as my best man?" At Chuen's quizzical look he added: "Miss Garshin and I are getting married. We got our license yesterday, but they've got a three-day law in Iberia."

"I'm so sorry! I have my ticket for airplane to China; leave this afternoon. If I miss, won't be another seat for a week. Wish I knew sooner."

"Oh. Too bad. When are you going?"

Chuen looked at his watch. "Should start in a few minutes."

"I'll go with you. Can you dear, sweet people excuse me for an hour?"

In the taxi Chuen said: "Glad to get back to civilization?"

"Right! What did you do after I left?"

"Collected evidence for 'several days. I got those letters from Góis to Dasht of Rúz, for instance. Took doing."

"What happened to Góis?"

"Oh, he got ten years; couple of others who were in with him, shorter terms."

"Was Abreu in on it?"

"No; he's all right. He wouldn't believe Góis was a crook at first, but when I convinced him he helped me very much. But while I was still in Hershid the most awful thing happened to *me!*"

"What?"

"Fouri made me marry her on threat of exposing me as Earth spy! Embarrassing, especially since I already got wife and eight children in Gweilin."

"What's the dope on Hasté and Fouri? She can't be his niece—"

"No."

"Mistress?"

"Think no. Hasté real old ascetic."

"She is a Krishnan?"

"Oh, yes," said Chuen.

"Then how—"

"Hasté was a deserter from one of earliest ships to land on Krishna. Pretty old then, over two hundred. Set himself up as holy hermit, lived in cave, became a power in their church in Gozashtand. Then when there was deadlock in election a few years ago, they picked him for high

priest as compromise. Not bad man really, but too small for his job. Was owing to his weak leadership the Church was failing, I think, which is after all good thing if you don't believe that astrological nonsense."

"But Fouri?"

"She was young girl from caravan of Gavéhona—you know, a wandering tribe, like our Gypsies. Went live with him while he was still hermit; don't know how much for religion, how much for regular meals. When he became high priest, she moved in with him—like father and daughter. Now Hasté getting really old, so Fouri start looking for another berth. Fall in love with you; genuine, I think. Made Hasté co-operate by threatening to expose him as Earthman.

"Meanwhile Hasté is looking for another berth too, since his Established Church is failing, so he entered plot with Fallon. He was going to hail Fallon as Messiah or something like that when Fallon took Hershid. We fixed that. But when you escaped, idea of getting married had become an obsession with Fouri. Hasté couldn't marry her, obviously, so she picked me; better than nothing, I suppose. Maybe she thought I'd fall in love with her and stay. Hard enough to tell what goes on in Earth woman's mind."

Hasselborg brought his friend up to date on the Batruni affairs, adding: "I didn't mention that Alexandra was Fallon's ex; the Batrunis don't know it and it would only em-

barrass everybody. How's Fallon doing?"

"All right. Was planning to put himself in trance when I left; wanted to make sure you took off with Julian first."

Hasselborg said: "It'll be years by objective time before they get back to Krishna, and anything might have happened by then. However, that's their lookout. You know, I'm sometimes bothered by the feeling that Góis and his gang were right and we and the Interplanetary Council wrong."

"I know, but not our business. We do our jobs. Speaking of jobs—you taking up this teaching offer?"

"I think so."

"Sounds dull."

"D'you like manhunting?"

"Of course. Why you think I work as a cop?"

"Well, I've had my fill. While I've usually taken things pretty much as they came, I pushed my luck on Krishna as far as anybody could, what with being shot at with crossbows and slashed at with swords and stabbed with knives and almost eaten by yekis." Hasselborg, feeling expansive, drew on his cigar. "I remember in Plato's 'Republic' where a character named Er gets knocked cold in a fight. His soul goes to Hades and later returns to his body, and Er comes to and tells how in Hades he saw the souls of other dead people picking their next incarnations. Ajax is choosing the life of a lion and so on. But Odysseus is smart. He figures he's had

enough excitement in his last life, so he's selecting the life of an obscure private citizen leading a peaceful existence. And that's how I feel. Any time you're in Beyrût, come see Professor and Mrs. Hasselborg and all the little Hasselborgs. We'll bore you to death with placid domesticity."

As Chuen waddled up the companionway into the fuselage, he turned to wave at Hasselborg, who waved back. A good guy, thought Hasselborg, but I hope I never have anything to do with the detective business again. That's that.

A young man brushed by Hasselborg, flashed him a quick glance, and ran up the companionway into the fuselage just before the door shut and the tractor towed the plane away to the catapult strip. Though Hasselborg had only a glimpse of the man's face, it was enough.

The man was the young Gozashando priest who used to come in and murmur in Hasté's ear, disguised as an Earthman by a wig that came down over his forehead to hide the antennae. Fouri must have sent him to Earth to track down her fugitive and bigamous husband!

THE END

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BOOK REVIEWS

"... And Some Were Human," by Lester del Rey, Prime Press, Philadelphia. 331 p. Ill. 1948. \$3.00.

Critics of science fiction insist that it can have no place as literature because it ignores the basic human values; because its characters exist only to carry out an ingenious plot-twist or put some novel gadget through its paces. However just this complaint may be when applied to the field as a whole, it is flatly refuted in the twelve stories by Lester del Rey which Prime Press has published under the title "... And Some Were Human".

It is characteristic of these stories that all are human. When they first appeared in this magazine and in *Unknown*, they stood high in readers' ratings. Now, five to ten years later, they hold up equally well. Whether their characters are dryads, elves, mutant gorillas, Venusian *sloahs*, or Lunar "monkeys"—or mere atomic scientists—all have a warmth about them which makes what happens to them the reader's serious concern, not for the sake of suspense or excitement, not for the sake of working out some intricate puzzle, but because they are people you'd like to know.

The bitter relationship which must have existed between the last Neanderthalers and their Cro-Magnon successors has certainly never

been so simply or well depicted as in "The Day is Done". That a robot should be lovable is made entirely believable in "Helen O'Loy". And in the two longest and most "human" stories in the book, "The Stars Look Down" and "Nerves", people like ourselves act and react as we would, though they are living in our future. The gentler stories lead up to the latter in a way which leaves the reader with something of a case of "nerves" when he closes the book.

The young artist, Sol Levin, who has drawn the chapter headings is successful except when he has tried caricature in the Cartier manner.

"Divide And Rule," by L. Sprague de Camp. Fantasy Press, Reading Pa. 231 p. 1948. \$3.00.

"The Carnelian Cube," by L. Sprague de Camp & Fletcher Pratt. The Gnome Press, New York. 230 p. 1948. \$3.00.

"One of the joys of the days of the old "middle-sized" Astounding was the series of middle-sized serials by Sprague de Camp, two of which, "Divide and Rule" and "The Stolen Dormouse", have now been combined in one volume by Fantasy Press. At the same time a new publisher, Gnome Press, has given us a new adventure in fantasy by de Camp and Fletcher Pratt which was probably destined to follow "The Incomplete Enchanter" and its successor

in *Unknown* had that revered magazine lasted.

In the two short novels in "Divide and Rule" de Camp is using the same detailed knowledge of history which gave us "Lest Darkness Fall"—now back in a new edition published by Prime Press at \$3.00—to set up hypothetical future societies which ape those of the past—with differences. In the title story invading "hoppers" have set up a feudal society with ultra-modern knights and all the conveniences which might have resulted if King Arthur had had the services of a modern industrial engineer. In "The Stolen Dormouse" it is the society of Renaissance Italy which the author is lampooning in his story of feuding industrial "families" and an underground of engineers.

"The Carnelian Cube" is brand new, and although it may not quite measure up to the two previous books by these incomparable collaborators, it is still quite unlike anything else the reader will find on today's market. The carnelian cube with its strange writing which archeologist Arthur Cleveland Finch uses to transport himself from Cappadocia of 1939 into a series of alternative 1939's in other streams of time may not be strictly scientific—or is it?

The three worlds of Arthur Finch are pure de Camp-Pratt slapstick, broad and a bit bawdy in spots, with every opportunity for ridiculous parallels played up to the utmost. In successive "dreams" he is Finch

Arthur Poet in a "perfectly rational" world governed firmly by one Sullivan Michael Politician—then an unfettered individualist in the employ of Colonel Richard Fitzhugh Lee, president of the Pegasus Lit'ry Society of Memphis—and finally a research historian in a world in which events of the past are re-enacted with grisly attention to every last detail. The fantasy is a little more heavy-handed than in the other Pratt-de Camp books, the incongruities laid on thicker, but the familiar and heady flavor is still there. These two books provide more sheer entertainment than any the fantasy publishers have yet given us.

"Sinister Barrier," by Eric Frank Russell. Fantasy Press, Reading, Pa. 253 p. Ill. 1948. \$3.00.

The idea that mankind is "kept" as the pets or domestic animals of an alien and invisible race was culled from a voluminous collection of reports of seemingly unrelated and inexplicable events by the late Charles Fort. It has been used many times since in science fiction and pure fantasy, but rarely as effectively as in Eric Frank Russell's headline novel from the early *Unknown*, "Sinister Barrier", now rewritten and expanded in book form.

Bill Graham, the hero of "Sinister Barrier", has three major mysteries on his hands, any one of which would once have been enough for a full-blown science fiction novel. He must find a connection among the

sudden deaths of a score of the world's great scientists. He must rediscover the perilous secret which they shared; and finally, he must combat and destroy that peril, before it can destroy him and all mankind. Another writer might have been content to use Fort's grim suggestion as his climax, but Mr. Russell has led his big card early and given his characters a known menace in place of an unknown one to fight. The result is a fast-moving adventure story in which punch follows punch from beginning to end, thoroughly documented with the clippings on which Fort based his statement that "I think we're property".

Fantasy Press has provided four illustrations by Edd Cartier which fit the mood of the book nicely. It may not make literary history, but it will be hard to lay down once you've picked it up.

"*Skylark Three*," by Edward E. Smith, Ph.D. Fantasy Press, Reading, Pa. 247 p. Ill. 1948. \$3.00.

The "*Skylark*" trilogy with which Dr. Smith amazed and delighted science-fiction fandom back in the late '20's and early '30's pioneered in many ways. Here space-opera, previously monopolized by the world-saver school of Edmond Hamilton, took on new freedom and stature. Here the super-physics type of story, galloping far beyond the forefront of the science of the time, had its real beginning.

Here the groundwork was laid for the "Lensman" stories which have been so standard a feature of Astounding SCIENCE FICTION in recent years. "*The Skylark of Space*", first of the three books, is now out in a new edition from Hadley while Fantasy Press has just published the second, "*Skylark Three*", and will soon bring out "*Skylark of Valeron*".

In "*Skylark Three*" our old friends, Richard Seaton and Martin Crane and their glamorous wives, are back, exploring ever-greater sweeps of the galaxy, defeating ever-greater enemies with ever-greater feats of science, and having a very good time doing it. Blackie Du Quesne, the menace of the original story, is soon eclipsed by the threat of Fenachrone, and Seaton is forced to delve ever deeper into the fundamental mysteries of the universe to avoid destruction. He is aided by his old friends of Osnome, and by new allies from the water-world of Dasor and ancient Norlamin. As the book closes, equipped now with the third *Skylark of Space*, he is ready to range beyond the galaxy and into other dimensions, and to explore still higher orders of matter and energy than our own science has yet revealed.

"*Without Sorcery*," by Theodore Sturgeon. Prime Press, Philadelphia. 355 p. Ill. 1948. \$3.00.

One by one the leading writers of fantasy and science fiction, past and

ASTOUNDING SCIENCE-FICTION

present, are taking their places in the lists of the new fantasy publishers. A collection of stories by Theodore Sturgeon has been long overdue. As Ray Bradbury, himself probably the most striking writer in this field, points out in his introduction to the Prime Press collection, "Without Sorcery", Sturgeon "writes with his glands"—and he seems to have an oversupply of glands.

Here is "It", probably the most unforgettable story ever published in *Unknown*. Here are such products of wacky logic as "Shuttle Bop" and "The Ultimate Egoist", not to forget that indescribable "Brat". Here is pure entertainment in the "Ether Breather" stories, "Artnan Process",

and "Two Percent Inspiration". And here are the grim irony of "Memorial" and the gentler story of the man who grew up, the rewritten "Maturity". There seems to be no type of science fiction or fantasy which Sturgeon has not written and written well. "Without Sorcery"—though the title will take some justification in view of such yarns as "Cargo"—has perhaps the greatest variety of any short-story collection yet brought out by the fantasy publishers.

Story headings for the book have been done by L. Robert Tschirky, who has not made the mistake of trying to make literal illustrations.

P. SCHUYLER MILLER

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BRASS TACKS

From another of the 6.7%. Incidentally, since you like Shiras' work, I ought to tell you she's in the 6.7% group, too!

Dear Sir:

I take my untrustworthy typewriter in hand to register a protest against Ursula Whitt's assumption, in her letter in the February Brass Tacks, that her taste is completely representative of that of all your woman readers. She is, of course, entitled to express any of her opinions, but when she says she does it "so that in future you will know what 'the little average woman-on-the-street' wants out of her science fiction", she generalizes from too few instances. Surely I'm as average as she is!

Personally, I thought "The Players of A" one of the best serials you've had in the seven years I've been a reader. Personally, I thought "Muten" rather undistinguished—"Dreams Are Sacred" tickles my own funnybone more—but an appropriate story for Astounding nevertheless. Personally, I read every word of your editorials, which have consistently struck me as intelligent,

timely, and useful—thanks for the one on radiation and mutations, the only item I have seen anywhere on a subject surely interesting to many women—and I also read all the articles I can understand—about 40%—and never begrudge the space for those that others with more training than I can appreciate. Personally, I agree with Mrs. Whitt about the streamlined men on the covers, though they are infinitely preferable to the cutie-and-octopus covers on other magazines, and I liked the Bonestell covers the best. Personally, I violently dislike Cartier's illustrations, for to me his humans seem brutal and his nonhumans stereotyped, but I realize that I'm in a very small minority here, and I expect you'll continue to use him and please other readers.

That's enough to show that different women react differently!

Now, about your last two issues: "Seetee Shock" strikes me as a little below average for your serials. "Manna" was rather nice; the rest of the February issue was, it seemed to me, average. "Opening Doors" is my favorite for March; like its pre-

decessor, it is well-written and the characters are convincing. I'm interested in contrasting these with Stapleton's *Odd John*, which dealt with super-youths, too. Stapleton, by the way, is one of the very few writers who have realized that there would be changes in human nature with changes in time, place, and techniques, and that the characters in his stories would have motivations different from those most common now.

My own favorites of recent years have been "Killdozer," one of the very best short stories you've had; Padgett's "Baldy" stories and his "Fairy Chessmen"; and "The Players of A." I like the Doc Methusaleh stories, and Dr. Winter's two, and some of Asimov's, though sometimes he gets too casual with his characters, forgetting to make them complete. And, though as a rule I prefer what might be called social science fiction to space operas, I've thoroughly enjoyed the "Lensman" stories.

By all means keep up the book reviews, and why not discuss some of the nonfiction which would interest us readers? There have been several recent books which have dealt seriously with suggestions for developing the psycho-logical sciences, for instance.

Please do find room in "Brass Tacks" for at least one protest—mine or another's, you must have had many—against your former contributor's too sweeping statements about what women like! — Eugenia L. Herman, Freehold, New Jersey.

You know, we DO have a subscription department. . . .

Dear Sirs:

I was down to see Ziggy last week—you know Ziggy, he's the little guy who hobbles around on leather-booted stumps—sells pencils at First and Main during the day and has a kind of office down in Rosie's place on South MacKenzie—or maybe you wouldn't know about the office—but anyway I drifted down that way last week and had a little talk with him.

It was a very disappointing talk, and while I may be able to figure out other ways and means to the same end, although Ziggy is kind of a last resort, I thought you would like to know about it.

Rosie's place was pretty busy when I got there, and so was Ziggy. It seemed that Jim Blaine wanted a doctor for one of his boys who had managed to collect a couple of foreign objects in his leg and shoulder, and Lew Whitney was trying to wheedle a couple pounds of precipitated poppy for his penthouse customers who had been wailing loudly ever since the government curtailed Lew's supply.

When Ziggy finally got around to me he was in a pretty bad mood—Lew Whitney is quite a haggler—but when he heard what I wanted he hit the ceiling.

"Look," he says, "tommy guns—I can getcha five in forty-eight hours at a half a grand apiece. Laudanum—a quart, as pure as it comes, in four hours—I'll even finger any man in

the city for twenty-five hundred, take it or leave it—but ASF—whadaya think I am, Shandoo or somebody?"

"Wait a minute," I protested, "it's only a magazine."

"Only a magazine," he howls, "just a plain old magazine."

He slapped his forehead, just missing his eye with the chewed end of his cigar.

"You've tried to buy 'em or ya wouldn't be here. Five minutes after they hit the stand"—Ziggy gestured—"they're gone. You oughta know."

"Yeah, but—" I said.

"Yeah, but," Ziggy mimicked, "I know whatcha gonna say, but, and I'll tell ya now that there isn't a second-story man in town what's found a copy ya could read—not even the day after release. They've all been thumbed so bad they're worn out."

"If that's so," I asked, "why—"

"Why?" Ziggy countered, "I'll tell ya why. Because every cop in town reads it—at least the ones what can read. If anybody knocked over a stand or nailed a shipment on the way in, he'd be jailed or pitch-gunned before the day was out."

"Listen," he continued, "you can't buy, borrow or steal ASF, last month's, this month's, or next month's, so you might as well go home and forget about it."

He waved his hand in dismissal.

"Come around again sometime," he says.

About then my eye caught the flicker of something under a pile of bottles and old rags.

"Say," I said, "isn't that—"

I never saw a faster draw in my life—I don't even know where it came from, but it was about the meanest looking .45 I'd ever seen, maybe because Ziggy was holding it.

"G'wan," he was screaming, "g'wan, beat it. Scram. Git out."

My eyes shifted between the gun and the current copy of ASF that was peeping coyly out from under the litter. I was doing some mental debating—my future vs. ASF.

It was with genuine reluctance that I decided on the former and backed out of the room. But I haven't given up. I haven't been able to bribe anyone yet, and I may have to do it the hard way, but I assure you that I am going to have a copy of next month's ASF if I have to fight every cop in town.—Jim Swartzniller, 1018 N. 7th Street, Temple, Texas.

*How could a creature that big hide
that close to highways in thickly
populated New York State?*

Dear John:

Sprague de Camp has answered J. C. May's call for a review of the new edition of Willy Ley's "The Lungfish, the Dodo, and the Unicorn"—which I finished at one sitting at 1:30 a.m. this morning—but some sideline remarks may not be out of order.

Lest it seem incredible that such animals as are mentioned in the first third of the book should still be hid-

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We have other plans which you can, of course, find out by writing to us at:

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ing in odd corners of the world, let me report the case of the Adirondack elk—properly wapiti, since the true elk is our moose. History has had it that the last of these big stags in the Adirondacks had been shot by “an intelligent hunter on the Raquet” back in 1836. Fine and reasonable—a few years ago I calculated that there is only one place in the Adirondacks where you can get more than about ten miles from a road. BUT on October 30, 1946 one William Vandivert, a New York photographer, headed into the woods along the upper Hudson, aimed at a “big buck”—and shot an elk, a bull weighing five hundred twenty-eight pounds and estimated at eight or nine years old. He’s big—I helped set up his head in an exhibit last fall.

Let me hasten to say that Vandivert’s elk has not been hiding from the hikers and campers since 1836, nor had his ancestors, in all probability. In 1915, it appears, the Benevolent and Protective Order of Elks resolved to restore its patron totem to its favorite state. The following year funds were raised to finance the importation of a “herd” from Yellowstone National Park—deponent saith not how many—which was duly liberated. Ten years later an elk census failed to find them. Then, in 1932, six more were released from a game refuge. Even if these are the source of the 1946 specimen, it must have been not one of the original herd but a first or second generation descendent, so that elk have been breeding in the

Adirondacks, quite unseen, for several years. Game wardens have since found traces of two small herds, by looking for their tracks in the winter.

When the revision of the book went to press, reports of the new finds from South Africa had not yet begun to come in. Maybe you can persuade Willy to do you a sequel for Science Fiction, comparing the little four-foot erect man-apes, *Australopithecus*, which have been showing up in such abundance, with the *agogwe*, the “little furred people”, four feet high, walking upright, in his chapter on “Rumors and Shadows”.

As for the larger, black and white *muhalu*, there are several large fossil apes which appear to have died out in Africa, such as *Proconsul*, not to mention the primitive Rhodesian man—I have lost track of his current Latin classification—if man he was.—P. Schuyler Miller, Schenectady, New York.

One of the more interesting items from Toynbee is, however, that wars and poor we have always with us—but wars are least cruel when governments are most arbitrary and absolute!

Dear Mr. Campbell:

Since I am filling out the inclosed questionnaire, I have decided to write a letter that I have been considering for several years.

Being a senior in physics, I have been following the technical periodicals for the past two years. Being a

rather ardent follower of science-fiction for the past ten some odd years I have been amused at the recent trend in scientific research.

Others have written to Brass Tacks on the matter of the scientist following the science fiction authors, but I have noticed a new and much more laudable tack being taken by the authors. Perhaps science will again follow in their footsteps.

In the past, the theme of most stories was the difficulties encountered by the individual with technology. Now it seems to be heading toward societies adapting to a rapidly changing technology. In present day existence, these problems are being met with methods that have been in use since man was knee high to an ax. This is more commonly known as horse trading.

It seems that there are several schools of writing on how to properly deal with this problem. Van Vogt, Shiras and others attack with a new brand of mankind. Williamson and company use our old friend *Homo sapiens* with a new philosophy and/or attitude. Nature being rather slow in making radical changes in any species, the changed philosophy-attitude school appears to be the more promising group.

Let us consider what the present authors of this group have been considering to solve some of the more urgent problems of the day. Williamson in his serial "With Folded Hands . . ." ". . . And Searching Mind" advocates the more extensive use of technology to change our atti-

tude. Well, this has been happening for the past hundred years and no radical changes in mankind have occurred. We still don't like each other. Van Vogt suggests in his A series more intensive personal integration and change in philosophy from Aristotelianism to Non-Aristotelianism. This I am afraid presupposes a more enlightened public. That is my reason for classifying him with the changers of the breed. This still buys us nothing.

Having recently been reading Toynbee, a new thought has popped into my head. According to Mr. Toynbee, the proper collection of factors are necessary to initiate any drastic change of view or purpose. Simak in his Foundation stories seems to be one of the few authors exploiting this theme. I suspect that he read Toynbee before starting that serial. I, personally, would like to see more stories of this type in Astounding. Perhaps it would be a wise idea to make Toynbee required reading for all Astounding authors. If we are going to change man, the best way seems to be to employ the past procedures that have done the most good.

For the Analytical Lab my ratings are for April:

1. "Plague." The Doc Methuselah stories have turned out to be one of the best in a long time as far as I'm concerned. Lafayette is a good writer and though I guessed the disease before the middle of the story, I still enjoyed it.

2. "Colonial." Neither good nor bad. Average is the best term for it.

3. "Undecided." It was a close fight between this story and "Colonial." The idea has been over-worked long enough, so I gave "Colonial" the nod.

4. "Devious Weapon" and "Prodigy" are a poor tie. The trouble with the short stories is that they do not have what I would term punch.

5. "Seetee Shock." I have a bone to pick with this story. From the minute I started to read it I knew Mr. Jenkins would come through with flying colors. This is the usual formula. But it was so obvious, the suspense—I use the word advisedly—so poorly maintained that I am surprised that you published it. Stewart is capable of better writing than this. His first story in this series was good but this is a poor sequel to it. If Jenkins died, it would have been a classic, i.e. one of the few where I was really surprised at the ending.—Jay Zemel.

*Don't know about those oaths.
Maybe they're Hypocritical? Anyhow,
Asimov's new Foundation
story—two-parts—is now on hand.
And Channis had reason for surprise!*

Dear Mr. Campbell:

Here are my ratings on the April issue for the An Lab:

1. "The Undecided": As usual Russell comes through with the best.

2. Tie between "Devious Weapon"

and "Seetee Shock". With "Devious Weapon" another first time author hits the gong. This was good, though I liked the treatment of "How to Crack a Thinking Machine" given in John MacDougal's "Chaos Coordinated" better.

Will Stewart's writing seems to have improved since "Opposites—React!" which I read again last week. The Brand transmitter is supposed to have about the same effect on society as Jack Williamson's "Equalizer". Sometimes I doubt that such inventions would do such a great deal of good as long as that strange thing called human nature remains unchanged. But maybe I'm just a pessimist.

3. "Plague": You're duplicating titles again. Murray Leinster had a story called "Plague" in the February 1944 issue. This one is better than the last Doc Methuselah tale, the one about hay fever. Incidentally, when Ole Doc's gypsum servant curses, does he use Hippocratic oaths?

4. "Colonial": An interesting new idea.

5. "Prodigy": Sturgeon can do better than this.

The illustrations this month were good. The cover by Santry was well executed, but it seemed a little crowded. One's attention is torn between the man in the foreground and the man and ship in the middle background. Your other new artist, Quackenbush, has a fine-line style that is a pleasant contrast to the dominant blacks of Orban.

I will now offer my opinion on the location of the Second Foundation, as I have deduced it from "Now You See It . . .". According to the rules of mystery stories, the elements of the solution should be given in the story. Now, the only places mentioned were Kalgan, Rossem, and Tazenda. The First Speaker eliminated Tazenda and Rossem, leaving only Kalgan. In addition, the First Speaker said (page 60), ". . . the Second Foundation's Expedition to Rossem . . . embarked yesterday and are returning to Kalgan." They couldn't return to Kalgan unless they had originally come from there. That would also explain Bail Channis' "vast, numbing surprise". Who

wouldn't be surprised to find that the dictator's worst enemy is hiding under his very shirttail? Of course, all this is so much wasted ink if the Foundation is supposed to be only in the minds of the Foundationers, as was suggested.

One more thing: What is the meaning of W2ZGU?—George W. Price, 519 East 41st Street, Chicago 15, Illinois.

But look, "Colonial" emphasised the danger of a venal or controlled, propagandistic press! And the danger in trying to apply human ethos and mores to an inherently nonhuman people!

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Dear Mr. Campbell:

My rating for the April issue:

1: "The Undecided." Wonderful! Splendid! Superb! Russell has really found himself again. Shades of "Symbiotica" and "Metamorphosite"! If Russell writes many more stories like this, he will very soon reinstate himself in the position of my favorite s-f author, always excepting the incomparable E. E. Smith.

2: "Plague!" The best Ole Doc yarn to date. Very well and cleverly done. Everything is fine, and there is but one major detriment; this detriment, however, makes it very unlikely that Ole Doc will ever reach an A-1 level in my estimation. These stories are laid on a deep-space background but lack a deep-space atmosphere; and Russell's stories, told in the same informal manner, nevertheless create this atmosphere. However, I should hate to see Ole Doc abandoned now.

3: "Seetee Shock" (III). Very, very uneven, with bits of excellent writing and suspense alternating with unnecessary, confusing, and/or unrealistic passages which spoil the whole effect. I still don't like the point of view of this serial, so belittling to humanity, and I cannot abide the ending, in which everybody shakes hands and makes up like a gang of Boy Scouts at the end of a juvenile.

4: "Prodigy." I have no adverse criticism to make of this story, but

have nothing good to say about it either.

5: "Devious Weapon." Another example of an imaginative article written in story form.

6: "Colonial." Very exasperating. There is enough Socialist propaganda being bandied about in these days without Astounding's adding to the din. I, for one, am tired of these stories about grasping interplanetary capitalists and their murderous henchmen. And I am still mossbacked and reactionary enough to believe that a free press is and always will be one of the best safeguards for democratic freedom. Believing this, I have not the least sympathy for Mr. Youd's obvious desire to kill off all reporters. Furthermore, despite all that is said in this story, I am not persuaded that Mr. Youd feels any real sympathy for the Venusians, for he leaves them still sunk in the same rut at the end in which they were found at the beginning.

The article on fluorine was good, although a little less so than I had expected. "In Times to Come" gave exciting hints of the future. The Clement story sounds marvelous, and I rejoice to see that Asimov is returning at last. But if you don't publish one other story of the caliber of "The Undecided" throughout 1949, I shall not blame you. One such story is worth wading through a hundred "Colonials."—Warren Carroll, South Berwick, Maine.

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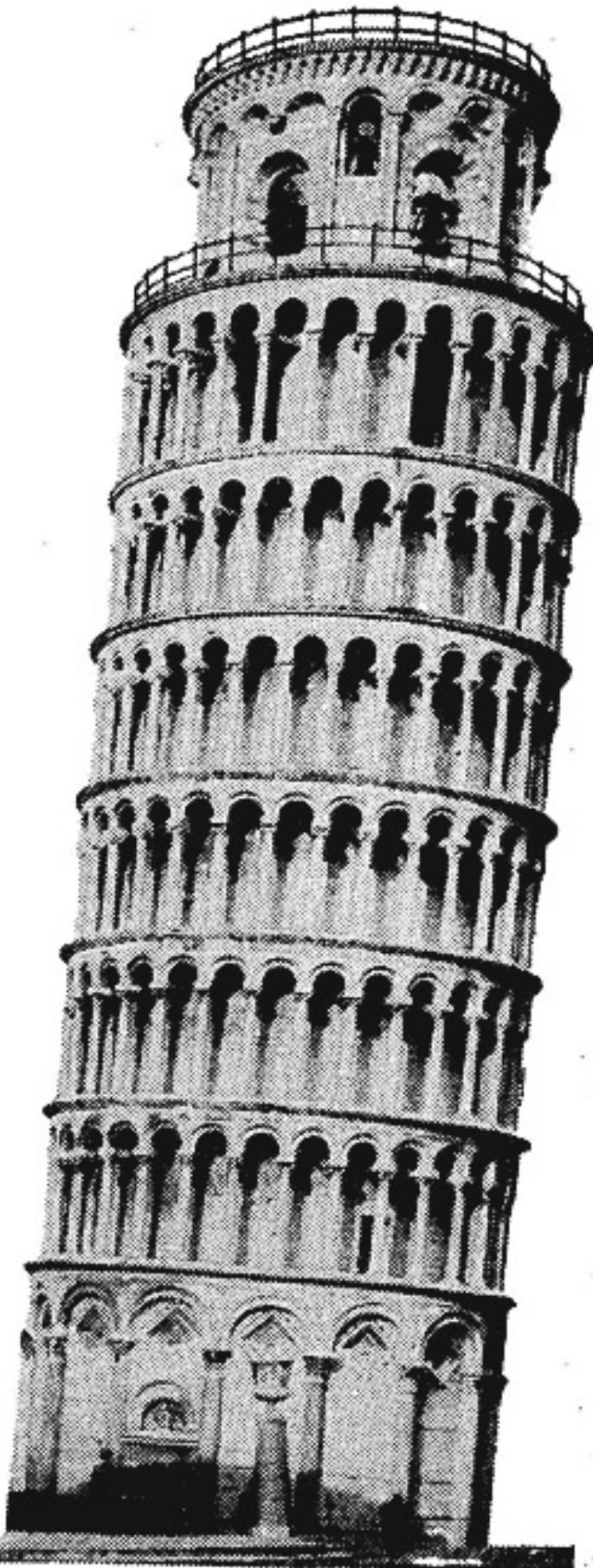
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